A comparison of the effects of open-ended and consensus seeking group discussion processes on the moral judgment of dental hygiene students

Lindsay Lorimer Rettie
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A COMPARISON OF THE EFFECTS OF OPEN-ENDED AND CONSENSUS SEEKING GROUP DISCUSSION PROCESSES ON THE MORAL JUDGMENT OF DENTAL HYGIENE STUDENTS

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the Faculty of the School of Education
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In Partial Fulfillment
of the Requirements for the Degree
Doctor of Education

by
Lindsay Lorimer Rettie
August 1981
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AND CONSENSUS SEEKING GROUP DISCUSSION
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CHAPTER I
INTRODUCTION

The nature and scope of practice of the health professions requires practitioners to make often difficult decisions regarding the health and welfare of others. The reasoning that supports such choices should be based not only upon the technical skills and scientific knowledge of the practitioner but also should be influenced by ethical considerations. For several decades educators in medicine, dentistry and nursing have wrestled with the dilemma of the place ethics and moral education have within the formal training of medical, dental and nursing students.

Today, the dental hygienist is emerging as the primary preventive care specialist and as such is assuming a greater role in the oral health care needs of the public. The dental hygienist often is the first member of the dental team to come in contact with the patient and therefore, has the responsibility of making the preliminary assessment of the patient's needs. In addition to traditional dental hygiene procedures, many new duties now are being delegated to these oral health care providers. As dental hygienists are assuming expanded duties and increased responsibilities for direct patient care, there is a growing need to investigate strategies which may enhance the moral judgment and
decision making skills of dental hygiene students.

**Statement of the Problem**

What is the relationship between educational experiences and students' moral judgment? Educators and psychologists have theorized that peer group interaction and classroom discussion of moral dilemmas stimulate moral development. The purpose of this study was to answer the following questions:

1. Can classroom, small group discussions of moral dilemmas affect the moral reasoning of dental hygiene students as measured by the Defining Issues Test (DIT)?

2. Which type of peer group interaction, open-ended or consensus seeking discussion, is more effective in stimulating the moral development of dental hygiene students as measured by the DIT?

**Need for the Study**

Dental hygienists are the only dental auxiliaries licensed to provide direct patient care. This profession has a history of more than 70 years of service to the public and now stands at the threshold of a new era in which increasing responsibility for patient care and welfare will be placed upon these health providers. The state practice acts governing the practices of dentistry and dental hygiene are undergoing change, expanding the duties and scope of practice of dental auxiliaries (ADHA, 1980). Since dental
hygiene was established as a separate oral health specialty almost three quarters of a century ago, dental hygienists have performed their services under the direct supervision of dentists. Now, as many states implement the Sunset Review Process, an increasing number of state governments are opting for less control over dental hygienists. The purpose of Sunset legislation is to reduce and/or eliminate unnecessary and duplicative regulation of professions and occupations. In 1979, the Federal Trade Commission (FTC) contacted state and local governments regarding projected FTC recommendations "...designed to eliminate unnecessary limitations on the rights of licensed dental hygienists to offer their traditional preventive services directly to the public" (ADA, 1979). The FTC, the Council of State Governments (1976) and proponents of Sunset Review (JLARC, 1977) believe that it is restrictive and an unnecessary duplication of expense to have one licensed professional supervised by another. The licensing process entails an extensive clinical and didactic examination which attests to the fact that each dental hygienist is competent to perform traditional preventive services. To require this professional to work only under the direction of another negates the need for licensure, limits the hygienist's freedom to practice when and where he/she desires and denies services to many potential patients who are now precluded from receiving dental treatment because of inaccessibility or finances. With changing laws, several states now allow
dental hygienists to practice independently with only general supervision. Pioneering hygienists are establishing independent practices and while the movement is still small, it may well be the practice mode of the future.

In addition to independent practice settings and direct patient care, many state governments are amending their practice acts to allow dental auxiliaries to perform dental services which are restorative in nature. These expanded duties include functions such as placing and carving amalgam and synthetic restorations, administering local anesthesia and performing limited periodontal surgery. Studies conducted at the Dental Manpower Development Center (Lotzkar, Johnson and Thompson, 1971 a&b) and the Great Lakes Naval Training Center (Ludwick, Schneobelem and Knoedler, 1963 and 1964) demonstrated that dental auxiliaries can be trained to perform selected dental procedures successfully. In addition, an extensive research project conducted at the Forsyth School of Dental Hygiene demonstrated that existing dental hygiene curricula can be modified to include special training in the performance of restorative and periodontal dental services (Lobene, Berman and Chaisson et al., 1974).

Thus the scope of dental hygiene practice is expanding and with this expansion come new responsibilities for patient care. As independent practitioners or expanded duty auxiliaries, hygienists increasingly will be exposed to ethical dilemmas which require moral decisions.
Consumers of health care increasingly are becoming aware of standards of care and are demanding competent and humanistic treatment. Now, with roles and duties expanding and patients more demanding, it is critical that graduating dental hygienists are prepared to meet the challenge of the future with mature moral judgment as well as technical skill and knowledge.

Current dental hygiene curricula are replete with detailed goals and objectives, processes and procedures which insure the competency of the graduate in performing tasks identified as dental hygiene services. The curriculum, however, does not provide the same detail of instruction or content regarding the moral and ethical development of the dental hygiene student.

In order to become a licensed dental hygienist, a candidate must pass extensive clinical and didactic examinations and must have graduated from an accredited two year, college-level program. There are approximately two hundred dental hygiene programs throughout the country which are standardized by an accreditation process. Accreditation Standards for Dental Hygiene Education Programs (1979), established by the American Dental Association, broadly states that ethical aspects of dental hygiene practice must be included in the curriculum. Detailed goals and objectives which normally are provided by the Curriculum Guidelines for Dental Hygiene Education (1979) promulgated by the American Dental Hygienists' Association are limited
in regard to moral education. These guidelines, while specific in terms of objectives and methodology for teaching dental hygiene skills and theory, do not address adequately the procedures for developing moral judgment. In accordance with these guidelines, a course in ethics for dental hygienists merely consists of a study of the history and structure of the profession and its code or principles of ethics. In general, dental hygiene educators have relied upon the socialization of students through role modeling and the study of the code of ethics in order to fulfill the mandate regarding the inclusion of ethical aspects in the dental hygiene curriculum. In general, the aim of socialization is to inculcate conformity and compliance with regulations and standards (Kohlberg, 1963b). Now that dental hygienists are assuming increased duties and new responsibilities for patient care, it appears that more than socialization will be required to enable these health professionals to make responsible and ethical decisions regarding the welfare of others.

The future role of dental hygienist will include increasing responsibility for patient care and this obligation will require proficiency in dental hygiene skills and knowledge as well as advanced professional and ethical judgment. Therefore, the goal of dental hygiene education must be to prepare these prospective professionals with all the skills and knowledge which will be required of them. This includes the cognitive skills and moral judgment needed
to cope with physiological, psychological and philosophical problems that might arise in future practice.

Since a goal of dental hygiene education is to prepare dental hygienists for ethical decision making and problem solving, dental hygiene educators are faced with the task of identifying educational experiences which will stimulate moral growth and imagination and will assist the future dental hygienist in functioning at the highest extent of his/her capacity in moral judgment. Educational experiences may be designed to induce intellectual conflict and problem solving by exposing the students to ethical dilemmas which will test moral decision making abilities. Educational research has shown that group problem solving which causes substantive conflict can facilitate intellectual growth, and discussions centering on ethical dilemmas can stimulate reflective thinking and produce the inner conflict which leads to moral maturity (Dewey, 1909; Piaget, 1932; Blatt and Kohlberg, 1976). Extensive research into the psychology of group influence indicates that conflict and consensus are interdependent and problem solving groups will experience differing degrees of conflict and growth depending upon the type of group interaction (Deutsch and Gerard, 1955; Torrance, 1957).

The problem to be addressed by this study is to identify the type of peer group interaction which is more effective in facilitating the moral development of dental hygiene students. The two types of peer group interaction
which are compared in this study are open-ended and consensus seeking peer group discussions centering on moral dilemmas which are relevant to the profession of dental hygiene.

These two types of peer group interaction were chosen for comparison because there has been considerable research surrounding and supporting the effectiveness of each in stimulating cognitive and/or moral growth. Blatt and Kohlberg (1976), Turiel (1966), Galbraith and Jones (1976) and Bliss and Johnson (1973) found teacher led, as well as leaderless, peer group discussions effective in stimulating moral growth. Taylor and Faust (1952), Hoffman, Harburg and Maier (1962), and Beisecker (1969) found that consensus seeking group problem solving sessions lead to increased cognition. Maitland and Goldman (1974) and Geis (1977) specifically compared open-ended with consensus seeking peer group discussions of Kohlbergian type dilemma stories and found that the consensus seeking groups tend to produce decisions which reflect higher levels of moral judgment than the open-ended groups.

Theoretical Rationale

Health providers are not the only professionals concerned with ethics and moral education. During recent years, moral and values education have received increased attention by educators and the general public alike. However, substantial research and theorizing have been conducted in this country for a hundred years (Morrill, 1980).
John Dewey (1897) led the way for much current educational theory, especially that of cognitive development, when he recognized the moral domain and suggested that moral development, being both cognitive and progressive, is stimulated by the thinking or problem solving process. Jean Piaget (1932, 1960) followed Dewey by proposing a cognitive developmental theory of moral judgment and proposed that peer interaction which provides an opportunity for role-taking and conflict is an effective stimulant to moral growth. Kohlberg (1964, 1969, 1971), building on the work of Dewey and Piaget, expanded and refined the cognitive developmental model, establishing hierarchial levels of moral reasoning while coalescing the psychological and philosophical components of morality. Kohlberg's theory places moral judgment squarely within the realm of developmental psychology. According to Kohlberg, moral judgment is best understood as a progressive or developmental process, influenced by interaction with the social environment, universal in nature and concentrating on reasoning rather than behavior. In focusing on reasoning, Kohlberg devised a system to assess levels of moral development and gathered data from several cultures to support his claim that moral reasoning is not only developmental but also is universal. His methodology involves confronting subjects with a moral dilemma story and eliciting responses regarding their solution to the dilemma. The responses are then analyzed for the type of reasoning employed by the subject.
Kohlberg's theory recognizes that while moral judgment is dependent on cognitive development, intellectual attainment is not a sufficient cause of moral development. In a 1971 paper, he suggested that social interaction as well as the desire to understand the viewpoints of others may move moral judgment to higher levels.

Followers of Kohlberg (Turiel, 1966, 1969; Blatt, 1976; Bliss and Johnson, 1973; Maitland and Goldman, 1974; Galbraith and Jones, 1976; and Geis, 1977; among others) have demonstrated that Kohlbergian type dilemma stories utilized to stimulate group discussions are effective in inducing moral development. Collectively, these studies suggest that role-taking, problem solving, and conflict or cognitive disequilibrium stimulate moral growth.

While Dewey, Piaget and Kohlberg focused their work on children's moral development, Perry (1970) applied many of the same principles to the ethical development of college students. Perry's work with college students indicated that this age-group demonstrates a range of levels of moral thinking, is prone to change and is particularly receptive to experiences which elevate judgment.

Piaget (1932) established the connection between social, especially peer, interaction and cognitive development. He pointed out that feedback is necessary for social as well as cognitive growth. It is clear that individuals are incapable of creating interpersonal social conflict and interaction. With that in mind, many educators since Piaget,
have demonstrated that group problem solving is responsible for improved cognition and therefore, is an effective learning strategy (Lewin, 1952; Maier, 1952; Bloom, 1953; and Haines and McKeachie, 1967). Generally, it has been found that groups organize material better, more consistently and detect the salient dimensions of problems more readily than do individuals. Zaleznik and Moment (1964) proposed the theory of "psychological interdependence" which indicates that in group problem solving the product is greater than the sum of its parts. This theory of nonsummativity applies particularly well to groups which are attempting to solve problems centering on social issues, indicating that group interaction stimulates greater creative thinking than is possible by individuals. The assembly or nonsummative effect also has been explored by Collins and Guetzkow (1964) who found that during group interaction associated with problem solving each idea is scrutinized while some are accepted, some rejected and some modified in an effort to find a harmonious solution. The opinions and perceptions of others tend to make the group member reexamine his own views. This process of feedback, introspection and seeing issues from another's point of view, often called role-taking, is consistent with the theories of Dewey and Piaget who first drew attention to the value of social interaction in affecting social, cognitive and moral growth. Collins and Guetzkow's study highlighted the importance of the problem solving activity which encourages group interaction,
stimulates conflict and leads to increased individual involvement.

A study conducted by Deutsch and Gerard (1955) indicated that individual thinking is affected by group interaction because of the information shared within the group and also because of normative influence or group pressure to conform. Both informational influence and normative influence are in operation to some extent during all group processes. They fluctuate, however, and impact on the individual differently under differing circumstances. The effectiveness of group problem solving is predicated upon the generation of information and the sharing aspect of the process. This often leads to intellectual opposition of ideas resulting in substantive conflict. Substantive conflict serves as a stimulus to critical thinking as members of the group test ideas and all members benefit from this critical exchange. Groups, as individuals, strive for harmony in decision making and this promotes normative pressure on members to seek agreement (Festinger, 1954). Agreement results in consensus which indicates that all group members not only agree with but also support the chosen solution. Group consensus seeking, therefore, raises the level of both intellectual influence and normative pressure.

Torrance (1957) determined that consensus is dependent upon conflict and that likewise conflict is stimulated by the desire to reach consensus. Torrance's
study provides a link between consensus and conflict. Beisecker (1969) concluded that substantive conflict improves participant involvement and increases the effort to bring about solutions which directly lead to consensus.

Individual cognitive growth is stimulated by group problem solving and substantive conflict. Since cognitive development is a basis for moral development, researchers have found that group discussions of ethical dilemmas or problems facilitate moral growth. It had been demonstrated by Blatt and Kohlberg (1976), Galbraith and Jones (1975) and others that the use of Kohlbergian types of dilemma stories for classroom discussion may supply the problem solving, role-taking and conflict producing experiences which Dewey and Piaget suggested are critical to moral growth. At the college level peer group discussions using Kohlbergian type dilemma stories have been investigated by Bliss and Johnson (1973) and Geis (1977) and found to be effective in facilitating the moral development of college students.

Since it has been established that consensus seeking and conflict are interdependent and just as conflict improves thinking and problem solving in general, it has been hypothesized that moral reasoning also is favorably affected by consensus seeking group interaction. Studies by Maitland and Goldman (1974) and Geis (1977) demonstrated that peer groups which discuss ethical dilemmas or problems in an attempt to come to consensus in identifying the issues
and developing appropriate solutions, tend to produce a higher level of moral reasoning than groups which address dilemmas in an open-ended discussion format. These studies also found that discussion groups, consensus seeking and open-ended alike, attain higher levels of moral reasoning than do individuals who confront ethical dilemmas separately.

Sample and Data Gathering Procedures

The sample selected for this study was comprised of two intact classes of dental hygiene students. The two treatment groups were randomly selected from the first year dental hygiene class at Old Dominion University and the nonequivalent control group consisted of the first year dental hygiene class at Idaho State University.

The measurement device was the Defining Issues Test (DIT), an objective, pencil and paper survey developed by James Rest. This instrument was administered to one-half of each group as a pretest measure and to each entire group as a posttest and follow-up measure. The posttest directly followed the treatment while the follow-up test was administered one month after the completion of the treatment in order to assess long-term or delayed action effect. All data were coded to maintain anonymity and each DIT was completed voluntarily by the student on her own time.

Definition of Terms

The following definitions were adopted for use in
this study:

1. **Conflict** as defined by Dewey (1909) refers to that cognitive disequilibrium which occurs when one's thoughts or beliefs are confronted by another set of thoughts or beliefs. Conflict may be operationally defined as active discussion which stimulates differing opinions of participants within the small group process.

2. **Consensus seeking discussions** requires the assigned group to discuss a dilemma story until collective opinion or general agreement can be achieved regarding the recommended action to be taken. (Adapted from Maitland and Goldman, 1974)

3. **Control group** was comprised of first-year dental hygiene students at Idaho State University.

4. **Defining Issues Test (DIT)** is a pencil and paper objective measure of moral judgment developed by James Rest and based upon Kohlberg's hierarchy of moral development.

5. **Dependent variable** was the mean score of the group as measured by the Defining Issues Test (DIT).

6. **Dilemma story** is a hypothetical case study which presents a common ethical quandary requiring the identification of salient principles and the recommendation of an action to be taken.

7. **Experimental subjects** were first-year dental hygiene students at Old Dominion University.
8. **First-year dental hygiene students** are full-time students having either sophomore or junior standing and enrolled in an accredited dental hygiene program at Old Dominion University or Idaho State University.

9. **Moral judgment** as defined by Kohlberg (1969) refers to reasoning or decision making in situations where one is presented with conflicting responsibilities; moral judgment is operationalized by a score achieved on Rest's Defining Issues Test.

10. **Open-ended discussion** allows the assigned group to discuss a dilemma story by expressing each person's views without requiring members of the group to adopt or accept the thoughts of others. (Adapted from Maitland and Goldman, 1974).

11. **Peer group interaction** refers to small discussion groups of five dental hygiene students.

12. **Role-taking** as defined by Piaget (1932) refers to the process of seeing an issue from another point of view or placing oneself in another's shoes. This can be demonstrated in group interaction where participants attentively listen to the opinions and reasoning of their peers.

**Limitations**

Major limitations which should be recognized in evaluating the results of this study include:

1. **Sample**: The two experimental samples were small (N = 18 each) and limited to students enrolled in one
dental hygiene program; and the control group was non-equivalent, small in size (N = 18), and limited to one dental hygiene program.

2. Treatment: The two treatments, consensus seeking and open-ended discussions, are very similar. Time constraints prevented the treatment continuing for more than six weekly sessions of two hours each.

3. Long-term effects: The follow-up data were collected one month after the completion of the intervention. It was not possible to assess the effects of these treatments at an interval greater than one month.

General Hypotheses

Two general hypotheses were the basis of this investigation:

1. The moral judgment of dental hygiene students is positively affected by peer group discussions of relevant dilemma stories.

2. Consensus seeking peer group discussions enhance the moral judgment of dental hygiene students more effectively than open-ended discussions.

Summary

In the first chapter, the need for sound moral judgment of dental hygienists has been established along with the theoretical background which supports the hypothesis that this cognitive process may be enhanced
through classroom experiences. The factors which stimulate moral development have been reviewed and analyzed in order to determine which of these elements may be manipulated in an effort to provoke greater moral maturity.

The purpose of this study was to determine if classroom discussions of moral dilemmas can be used to stimulate moral development and which group interaction, open-ended or consensus seeking, is more effective with dental hygiene students. The ultimate goal of this study is to provide a model and recommendations which may lead to changes in all dental hygiene curricula. This investigation may identify those learning experiences which enhance the level of moral judgment of dental hygiene students. Incorporation of such strategies into the curriculum would prepare these future oral health practitioners to meet more effectively the challenges of dental hygiene practice.
CHAPTER II
REVIEW OF THE LITERATURE

This study sought to bring selected theories of moral development and group influence together in an attempt to identify learning experiences which are effective in raising the level of moral reasoning of dental hygiene students. Four major areas of research have been reviewed; these include the relevant research surrounding the theories of cognitive-development as a basis of moral judgment, moral education and interventions which impact on moral reasoning, group process and the effect of problem solving on group and individual thinking, and lastly, the relationship of dental hygiene training to moral education. This chapter concludes with a summary and integration of the relevant theories and related research which support this investigation.

Cognitive-developmental Theory of Moral Judgment

The cognitive-developmental theory of moral judgment which provided the conceptual framework for this research often is associated with the work of Lawrence Kohlberg. Kohlberg related moral judgment to the cognitive-developmental model because he observed that moral reasoning progresses through invariant stages in an upward direction, that cognitive stimulation facilitates progression through
these stages and that social interaction leads to the reorganization of previous beliefs and reasoning. While Kohlberg is well-known and recognized for his contribution to the moral cognitive-developmental theory and for his hierarchical arrangement of moral reasoning, he based his propositions on the work of John Dewey and Jean Piaget. In fact, Kohlberg himself has indicated that many of his theories are "...largely warmed-over Dewey" (Kohlberg, 1972, p. 14). In addition to building on Dewey's work, Kohlberg's establishment of a six stage hierarchy of moral development was an attempt to "...retain the best of Piaget's scheme and fit it into a more refined, comprehensive, and logically consistent framework," (Hoffman, 1970, p. 276).

John Dewey is credited with being the father of the cognitive-developmental approach to moral education. He brought recognition to the moral domain and identified the following levels of development: the pre-moral, the conventional, and the autonomous. He noted differences in the way individuals think as they mature and progress through school and concluded that problem-solving and peer interaction contribute to cognitive and moral growth (Dewey, 1909).

While Dewey suggested that children experience progressive levels of moral thinking, it was Jean Piaget who provided psychological evidence supporting the developmental model as he defined specific characteristics of the moral reasoning stages through which children progress.
Piaget suggested that there are universal trends of moral judgment which correlate with age and school experience. He placed children's moral reasoning into two categories: the earlier heteronomous stage is represented by the recognition of rules as absolutes which are to be strictly followed simply because they exist. The later autonomous stage is reflected in recognizing that rules are agreements by which people can live and play or work together cooperatively (Piaget, 1932).

While Piaget's two stage theory seems limited, it did provide the pioneering link between moral reasoning and psychological development. Piaget further postulated that social interaction, especially among peers, provides experiences in active cooperation and role-taking, seeing another's point of view, which serve as catalysts for reorganization of moral reasoning at a higher level (Piaget, 1932).

Piaget's proposition that peer interaction is responsible for moral growth has led to many experimental studies designed to elevate children's moral reasoning through social interaction. Bandura and McDonald (1963) examined a school training program as a possible cause of shifts in the moral orientation of children. While their investigation failed to support Piaget's developmental theory, other studies (Crowan et al., 1969; Crowley, 1968; Lickona, 1976) have demonstrated that social interaction and education are effective in stimulating moral growth.
Lawrence Kohlberg postulated an invariant six-stage sequential theory of cognitive moral development based upon intensive longitudinal studies of adolescent boys. These investigations established the universality of his theory. He interviewed boys in Israel, Turkey, Mexico, Canada, Taiwan, as well as the United States, and found that his six stages are culturally universal, but that the frequency of any given stage is distributed differently among various cultures. The higher levels of thinking, principled thinking, are found more frequently in democratic societies (Kohlberg, 1971). This is not surprising since Kohlberg's philosophy comes from the deontological point of view which emphasizes principle rather than consequences and is influenced by the teachings of Immanuel Kant (1964) and Rawls (1971), and therefore, deeply steeped in the tradition of justice and fair play.

Just as Dewey had, Kohlberg (1969) found that development in moral judgments results from interpersonal experiences that encourage conflicting dialogue which in turn stimulates the reordering of thinking. This observation became one of the assumptions upon which Kohlberg based his cognitive-developmental moralization theory. Kohlberg (1976) summarized these assumptions in the following way:

1. moral development has a basic cognitive structural or moral judgmental component;
2. the basic motivation for morality is a
generalized motivation for acceptance, competence, self-esteem, or self-realization rather than for meeting biological needs and reducing anxiety or fear;

3. major aspects of moral development are culturally universal, because all cultures have common sources of social interaction, role taking, and social conflict which require moral integration;

4. basic moral norms and principles are structures arising through experiences of social interaction, rather than through internalization of rules that exist as external structures; moral stages are not defined by internalized rules, but by structures of interaction between self and others; and

5. environmental influences in moral development are defined by the general quality and extent of cognitive and social stimulation throughout the child's development, rather than by specific experiences of discipline, punishment and reward.

As he attempted to classify levels of moral reasoning, Kohlberg's (1969) interviews consisted of a series of dilemma stories to which the respondent would be asked to find solutions. By analyzing reactions to ten moral scenarios, Kohlberg delineated three levels of moral reasoning; the preconventional, the conventional and the postconventional. He further divided each level into two stages which resulted in a hierarchical arrangement of moral reasoning which generally has been presented in the following way:

Preconventional Level

Stage 1: The punishment and obedience orientation.
Stage 2: The instrumental relativist orientation.

Conventional Level

Stage 3: The interpersonal concordance of "good boy - nice girl" orientation.

Stage 4: The "law and order" orientation.

Postconventional, Autonomous or Principled Level

Stage 5: The social contract, legalistic orientation.

Stage 6: The universal ethical principled orientation.

The preconventional level also may be referred to as the "premoral" level because actions usually are based on self-interest and consequences. This stage is characteristic of preadolescent children who display egoistic and hedonistic thinking and behavior. Stage 1 thinking focuses on physical consequences which equate behavior with punishment or reward. Compliance with rules is based upon fear of punishment rather than on respect for others or a sense of fair play. Stage 2 reasoning is based upon hedonistic desires and self-serving tendencies. While the Stage 2 thinking recognizes the interest of others and may cooperate with them, the primary focus of attention is on self.

The conventional level, as the name implies, is the most common level of moral reasoning. Most adolescents and adults in all societies operate at this level. Behavior
and thinking is influenced heavily by custom and conformity with social order and expectations. The individual who exhibits Stage 3 thinking is anxious to please others in order to gain recognition and praise. This person complies with rules and standards not out of respect for others but in order to win approval. Stage 4 is called the "law and order" stage because individuals who display this stage of reasoning strongly believe in social order and hold that rules are to be followed and authority obeyed under all circumstances.

The postconventional level is based on principled thinking which rarely is exhibited by adolescents and is reached by few adults. Reasoning at this level is guided by principles that are adopted and internalized by the individual and which may or may not agree with custom or convention. Stage 5 thought has a social contract orientation. The person who operates at this stage upholds laws which he believes to be just, values social order and assumes that he has a contract with society. Stage 6, the highest stage identified by Kohlberg, emphasizes individual responsibility and conscience. Persons reasoning at this stage value principles above laws and individuality is stressed; the principles of justice, equality and personal dignity are central to the sixth stage of reasoning.

Kohlberg (1971) proposed that all people progress through moral stages and that each stage is a reorganization of the preceding stage; therefore, later stages are
better than earlier stages. He maintained that logically each stage is superior to the one preceding it, that persons strive to reason at higher levels, and that the higher stages of reasoning are better equipped to solve complex moral problems. Although these assumptions seem indisputable, Alston (1971), Simpson (1974), Peters (1975), among others have taken exception to what has come to be known as Kohlberg's "higher is better" philosophy.

Alston (1971) pointed out that while a person may have the capability and comprehension to reason at a principled stage, he may, of habit, operate at a lower stage. Simpson (1974) charged Kohlberg's theory with cultural bias. She based this charge on the fact that Kohlberg's highest stages focus on the principle of justice whereas she found that many cultures do not support or have the opportunity to experience justice, equality and freedom for all. She questioned whether Kohlberg's hierarchy is really universal or if in reality, it may be tailored to the democratic ideal.

Peters (1975) supported Simpson's challenge and further charged Kohlberg with philosophical exclusivism. He criticized Kohlberg's bias toward postconventional thinking and pointed out that since the vast majority of people reason at the middle stages, conventional morality, as exhibited by Stages 3 and 4 thinking, should not be underestimated as being the backbone of ethical society. James Rest (1974) summarized the thoughts of others when he
suggested that Kohlberg might have depended too heavily on the Kantian and Rawlsian philosophies of justice.

Further criticisms of Kohlberg's theory have been leveled at the premise of invariant upward movement through the stages. Kuhn (1976) and Holstein (1976) found that adolescents and adults often fixate at levels below their capacity and even may experience regression. Indeed, retrogression actually was found in follow-up studies by Kohlberg and Kramer (1967). The typical regression of college students to Stage 2, hedonistic thinking, has been documented by Perry (1970), Kohlberg and Kramer (1967) and Kohlberg (1975). While the above remarks point out that moral development at times may be sporadic and culturally relevant, the same critiques serve to affirm Kohlberg's assumptions that moral reasoning progresses through an invariant sequence while major aspects of moral development are common to all cultures and moral growth and development are greatly influenced by the environment.

Kohlberg's observations and classification of levels of moral reasoning were accomplished through interviews which centered upon the presentation of dilemma stories and the interviewees' rational regarding appropriate actions. The interview protocol was initially established by Piaget and later adopted by Kohlberg, while the scoring system as originally developed by Kohlberg has undergone considerable change and refinement. This continual change in the scoring system has threatened the validity of Kohlberg's Moral
Maturity Index and has encouraged the development of alternative measuring systems (Kurtines and Grief, 1974).

One of the best recognized indices of moral development was designed by James Rest (1979a, b, c). Seeing the need for a standardized and streamlined assessment instrument for moral judgment, Rest created an objective, pencil and paper survey based upon Kohlbergian type dilemmas. Rest's Defining Issues Test (DIT) allows the respondent to identify and prioritize the critical issues in each case presented and encourages him to consider the value of various alternative actions. Through the medium of expressing opinions about social problems, the respondent indicates his level of moral reasoning. Rest's test which delivers a P index or score representative of principled thinking has been found to have construct and content validity. The P index has been found to correlate \( r = .75 \) with Kohlberg's Moral Maturity Scores (MMS); but, other studies have shown great fluctuation in correlation due to group differences, type of stories used and scoring methods (Rest, 1979a).

In addition to various indices or measuring devices, several investigators have developed alternative hierarchical arrangements of moral reasoning. Dewey's three stage hierarchy and Piaget's two level structure dwelt on children's development, while Kohlberg's model is well suited to adolescents and adults. Hogan (1970) developed a six stage survey of Ethical Attitudes which stresses the importance of social responsibility. The pinnacle of Hogan's index is
a stage which demonstrates a high regard for social order and is similar to Kohlberg's Stage 5.

Perry (1970), who concentrated his studies on the moral development of college students, created the Intellectual and Ethical Development measure. Perry's investigations which included a longitudinal study of Harvard students between the years 1954 and 1963, led him to develop a nine stage hierarchy of intellectual and ethical development. Perry's first two stages represent a dualistic "we're right, they're wrong" emphasis. Stages 3 and 4 display multiplicity of thinking or a recognition that there may be varying points of view. Stage 5 seems to be the turning point when the student goes through a period of relativism, wherein truth becomes relative and choices become difficult. The final stages represent the development of a pluralistic commitment. At this point, the student is able to choose a personal position, life-style or purpose, while recognizing that he may have selected only one out of many viable options (Perry, 1970).

Perry found that the critical Stage 5 change is accompanied by considerable disequilibrium as the student struggles to find personal identity and commitment. Perry's model is similar to Kohlberg's, but devotes nine stages to classifying the reasoning of young adults.

As did the investigations of Kohlberg and Kramer (1967), Perry's (1970) studies documented the fact that the college experience often leads to a temporary retrogression
in moral reasoning as students pass through a relativistic stage during which they view ethics as situational. While the stages and psychological bases of Perry's and Kohlberg's models are similar, they are founded on differing philosophical contexts. As stated before, Kohlberg's model is based on the Kantian tradition of justice while Perry espouses an existential, personal commitment ideal.

Much has been said about the cognitive nature of the moral cognitive-developmental theory in which the emphasis has been placed on thinking rather than behavior. However, Dewey and Piaget, as well as Kohlberg and others, have maintained that behavior is a reflection of the cognitive process. Indeed, Kohlberg claims that moral reasoning is "...the single most important or influential factor yet discovered in moral behavior" (1964, p. 50).

Rest (1979a) extensively reviewed research that compared moral reasoning, as measured by the DIT or Kohlberg's MMI, and moral behavior. These studies indicated that a significant correlation exists between moral indices and the following manifestations of moral behavior: cooperation, cheating, conformity, sensitivity, sharing and even voting. Since the majority of studies reviewed by Rest indicated that moral judgment is significantly correlated with behavior, the importance of stimulating principled thinking becomes even more evident.

Early studies of the relationship between moral judgment and cheating conducted by Krebs (1967) and Schwartz,
Feldman, Brown and Heingartner (1969) signified that non-principled thinkers are more likely to cheat than principled thinkers. Later investigations by Harris, Mussen and Rutherford (1976) supported the earlier findings and indicated that while the level of moral reasoning does not predict the penchant for cheating at the preconventional and conventional levels, the predilection for noncheating is evident among postconventional, principled thinkers; or as Kohlberg stated it "...cheating itself is not a sign of low maturity of judgment but consistent noncheating is a sign of high maturity" (Kohlberg, 1971, p. 460).

In a study of cooperation, McNamee (1975) found that college students who reasoned at Stage 6 were more likely to assist a fellow student in need than were students reasoning at lower levels. Krebs and Rosenwald (1977) investigated the cooperative tendencies of experimental subjects and found that those who operated at Stage 4 reasoning were more compliant with the research protocol than were Stage 3 thinkers.

Carol Gilligan (1977) recognized the varying levels of moral sensitivity that individuals exhibit. She found vast differences among subjects regarding their ability to recognize moral issues. She made a connecting link between behavior and moral sensitivity as she concluded that persons who are morally insensitive and therefore unaware of ethical situations or dilemmas, are at best unlikely to behave consistently in an ethical manner. Drawing on Gilligan's
research, one might make the assumption that raising the moral sensitivity of individuals might increase the likelihood of moral behavior.

The case has been made for moral judgment's influence on moral behavior. While no documentation can be supplied which directly correlates behavior with judgment, a connecting link has been suggested by Kohlberg (1971), Rest (1979b) and others. Assuming that the goal is to prepare dental hygienists to think as well as to act responsibly and morally, methods must be found which can influence moral judgment.

The cognitive-developmental theory, which is the basis of this thesis, suggests that learning experiences, group interaction and cognitive conflict stimulate moral maturity. Cognition may be stimulated in a classroom setting by confronting students with relevant dilemmas which require problem solving techniques. Personal interaction may be added to the learning experience by allowing small groups of students to become problem solving teams. The nature of the team of group process, in turn, may introduce varying levels of intrapersonal conflict and disequilibrium. Further review of educational experiences and environments which have resulted in cognitive and moral growth is now warranted.
It was observed by Kohlberg (1973), Rest (1979a) and others that most adults seem to stagnate in moral development when they leave school and fixate at the level they attained as they completed their education. It may be stated generally that as long as education continues, moral growth continues. It has been suggested that the cognitive stimulation of education and the interaction among scholars are responsible for the continued growth (Ernsberger, 1976; Trow, 1976; Lawrence, 1978; Rest, 1979b). While schooling and education in general stimulate moral maturation, many studies have been conducted in order to ascertain specifically what methods stimulate moral development, what may be considered to comprise moral education and what are the successful strategies connected with moral education.

The purpose of this study is to identify teaching techniques which are effective in raising the moral reasoning of dental hygiene students. In the future, educators ought not be satisfied with merely socializing students, if morally productive strategies have been identified.

It has been established that moral growth is dependent upon cognitive ability and an opportunity for interaction with one's environment, producing conflict or disequilibrium which is the forerunner to reorganizing thought at a higher level (Kohlberg, 1971). The goal of moral education is to enhance moral reasoning and several
studies have been conducted to determine if educational interventions can be effective in improving moral reasoning. Just as the dilemma story has become a common tool for assessing moral maturity, it has also become a popular technique for creating simulated conflict situations. If peers actively discuss the hypothetical case, conflict occurs producing disequilibrium and the reorganization of thought resulting in moral growth. This sequence of events seemed logical to many educators who attempted to raise the level of moral reasoning through the classroom discussion of moral issues and dilemma stories.

Blatt, a student of Kohlberg (Blatt and Kohlberg, 1976), is credited with being the first to initiate a series of intervention studies affecting the level of moral judgment of students. Blatt's first study utilized a small number of sunday school students who after pretesting were encouraged to actively discuss moral situations for one hour a week. Upon completion of a twelve-week period, the children were posttested with the same moral judgment interview in order to assess the effects of the discussions upon their stages of moral development. A follow-up interview was conducted one year later to determine long-term effects. While the number of students involved in this study was very small (N = 11) and the posttest and follow-up interview results were mixed, it was concluded by the researcher that those students who took an active interest in the discussions seemed to progress in moral judgment and
sustained this increase over the long run. Blatt (1976) later replicated his initial investigation in a public school setting using larger numbers of students with mixed racial and socioeconomic backgrounds. This twelve-week study stressed peer interaction with little or no teacher influence. The pretest to posttest change was significant with most students gaining by one complete stage and sustaining this improvement on the one year follow-up. Blatt concluded that the peer interaction, the exposure to varying opinions and the conflict resulting from the problematic situations were influential in raising the level of moral judgment of these students.

Elliot Turiel (1969) used role-playing situations to stimulate active reasoning. He theorized that in order to grow morally, students need to be exposed to one level higher than their own thinking. Turiel took part in the role play challenging the participants to think creatively as he responded using various levels of moral judgment. He found that students accept levels of moral thinking one step above their own because they can understand and identify with it, while they reject thinking at levels below their own because it seems unproductive to them. The same is true of reasoning at more than one step above because they cannot comprehend this logic. Turiel concluded that the cognitive disequilibrium which is the precursor to the reorganization of thought is stimulated most effectively by exposure to reasoning one level above that of the subject.
Turiel's "plus-one" theory which coincides with Kohlberg's assumption that moral development is incremental, has gained recognition as Turiel's work has been replicated by other researchers.

Tracy and Cross (1973) expanded on the notion of higher stage preference. In a study using the "plus-one" process with teenage boys, they found that the subjects who were exposed to one stage higher levels of reasoning tended to advance more than the non-treatment control subjects.

An investigation by Keasey (1973) also compared the influence of varying levels of reasoning. Keasey, who exposed students to one stage higher reasoning, one stage lower reasoning, and opinions with no rationale, found that only the group exposed to one stage higher reasoning was positively influenced in moral judgment.

While Turiel was successful in using role play to stimulate the reasoning of high school students, other researchers have found role play is effective also in raising the level of moral judgment of college students. Arbuthnot (1975) investigated the impact of enacting a moral dilemma with cohorts who reason at a higher stage. Using a one time intervention with 96 psychology students, he found both immediate and delayed increases in moral reasoning in the role play group when compared with the passive observer groups. Arbuthnot attributed the moral maturation of acting groups to the disequilibrium caused by actively confronting moral issues in conjunction with
exposure to higher levels of reasoning.

Turiel's investigations of moral development based upon exposure to one stage higher reasoning reinforced several of Kohlberg's original principles. The "plus-one" research supported the developmental principle that an individual will assimilate only that level of reasoning which is appropriate for him and that upward movement depends not only on exposure to the next level of thought but also on cognitive conflict. Based upon these principles, teaching programs have been developed which are designed to arouse moral conflict and present moral thought one stage above the subjects' own thinking (Rest, Turiel and Kohlberg, 1969).

In the early 1970's, Kohlberg and his colleagues implemented a moral education program in the Connecticut Women's Prison. This group of researchers and educators, attempting to replicate the earlier findings of Blatt and Turiel, found that the prison environment was not conducive to moral growth beyond the conventional level. Kohlberg agreed with Dewey that stimulating just thought is impossible in an unjust environment. This added another dimension to the growing list of conditions which surround moral education.

Several studies have been conducted with college students as subjects and group discussions of moral dilemmas as the method, and some of these have resulted in changes in curricula. Kohlberg (1973) reported on research conducted by Boyd in which college freshmen and sophomores
participated in a program centering on moral discussions. Forty percent of these students moved from conventional thinking to principled thinking. Rest (1979a) described the research of Panowitsch-Balkcum in which students enrolled in a quarter long ethics course were compared with those in a logic course. Panowitsch found that exposure to practice in moral problem solving significantly increased students' moral judgment as measured by Rest's DIT.

As the success of the early intervention studies became widely known, investigators attempted to distinguish the critical components of using group discussion of dilemma stories to raise the level of moral reasoning of individuals. Maitland and Goldman (1974) designed a study which focused on the group interaction associated with moral enhancement programs. They postulated that group discussions which attempt to come to consensus will produce a higher level of inter- and intrapersonal conflict than group discussions which remain open-ended. They further postulated that either type of group interaction will result in greater cognitive disequilibrium than solo decision making. Maitland and Goldman based their research on the premise that the greater the need for agreement, the greater the pressure to see issues from the other person's point of view. The result is greater inner conflict and cognitive disequilibrium. Further, higher levels of disequilibrium result in enhanced levels of moral reasoning. After pretesting and presenting dilemmas to a high school class
which had been divided into three groups, they asked the first group to address dilemmas through an open-ended discussion. The second group was asked to discuss and reach consensus on the moral issues which surrounded each dilemma story and the third group worked as individuals trying to solve the dilemma vignettes. The researchers found that not only was the discussion-to-consensus group mean score higher than either of the other group means on the self-designed, Kohlberg-like assessment instrument, but also that the individual scores in the consensus group were higher than individual scores in the other two groups. Furthermore, it was noted that the open-ended discussion group scored higher than the group of solo decision makers. These findings reinforce the premise that peer group interaction favorably influences moral decision making.

Maitland and Goldman's study was later replicated by Geis (1977) with college students as subjects and using Rest's Defining Issues Test (DIT) as the measurement instrument. Both Maitland and Goldman's and Geis' interventions were short term, basically "one-time" experiences which combined the treatment phase and the posttest assessment into one experience. These investigators recommended extending this study over a longer period of time, and suggested incorporating this type of interaction into a permanent part of the curriculum.

The essence of the research conducted by Maitland and Goldman and Geis was to assess the effect of the
dilemma stories and group interaction on the groups' problem solving capabilities. The focus of the present research, however, is on the effect of the group process on the individual's ability to address dilemmas. Since this study was interested in affecting change in individuals rather than groups, it extended over six weeks and clearly separated the posttest from the treatment sessions by having each participant individually complete the measurement instrument. Another innovation was the addition of a follow-up test one month after the conclusion of treatment. This was designed to assess any long-term and delayed effects of the treatments on the subjects.

The objective of the present research is to test the viability of the dilemma story/group interaction teaching strategy as a valid promotor of principled reasoning among dental hygiene students.

Intervention studies using moral dilemmas as discussion material have been found to be effective in enhancing the moral reasoning of all levels of students. It is particularly impressive to discover intervention techniques which result in principled thinking, since this is the level which most college students strive for and seldom attain.

Kohlberg, Turiel, Rest and others have cited peer group interaction as essential to moral growth and development. Maitland and Goldman (1974) and Geis (1977) implied that consensus seeking group interaction creates increased
cognitive disequilibrium and thereby stimulates moral growth. This review of related research now will establish a connecting link between intrapersonal conflict or cognitive disequilibrium and peer interaction or group process.

**Group Process**

Almost a century ago, John Dewey (1897, 1909) proposed that peer interaction and problem solving activities promote cognitive growth. He further proposed that moral reasoning is a cognitive function. Later, Jean Piaget (1932, 1948) added to Dewey's theory by recognizing that it is the role-taking nature of peer interaction along with the inner conflict produced by exposure to opposing views which influence moral growth.

By mid-century, Festinger (1957) had demonstrated that cognitive dissonance or inner conflict is the first step to cognitive change. The cognitive dissonance theory states that incongruity between an individual's own thinking and that of others fosters a change in personal belief or attitude in an effort to reduce disequilibrium or inner conflict. Festinger's theory further adds to those of Dewey and Piaget and connects the role-taking aspect of peer interaction with disequilibrium as a precursor to cognitive development. Kohlberg (1975) integrated the above theories and proposed that peer group interaction provides the individual with the role-taking, conflict producing experiences necessary for moral growth. He even
argued that some forms of social interaction are especially productive as they expose participants to multi-stage perspectives. The challenge of exchanging views on socio-moral issues in a noninhibiting environment seems to stimulate moral development (Kohlberg, 1976).

Selman (1976) related role-taking ability to levels of moral thinking. He developed a set of social role-taking stages which parallel Kohlberg's stages of moral judgment and he suggested that individuals progress through the stages of both these hierarchies at a similar pace. Selman further proposed that social role-taking or the ability to appreciate the perspective of others is a necessary, while not sufficient, condition for moral maturity or principled thinking. Along with Lieberman (Selman and Lieberman, 1975), he conducted a classroom intervention study, exposing school children to filmstrips which depicted moral dilemmas, followed by classroom discussions of the ethical issues involved. These researchers employed both teachers who were knowledgeable regarding moral developmental theory and uninformed teachers. While they found that the filmstrip/discussion format was effective in raising the levels of moral thinking of the subjects, reconfirming the proposition that role-taking stimulates moral growth, they also concluded that the teachers' knowledge of moral developmental theory was not a critical factor.

Saltzstein (1975) agreed with Selman's theory that role-taking ability and moral development are related and
additionally suggested that role-taking experiences can be an effective technique in stimulating moral development. Saltzstein recognized a connection between moral reasoning and peer group interaction. With Osgood, he studied the relationship between levels of moral development and conformity to the peer group (Saltzstein and Osgood, 1975.) Interviewing preadolescent and adolescent children about a hypothetical team competition, these researchers found that as moral reasoning develops, so does interdependence, loyalty and commitment to group goals. Since it has been proposed that cooperation with the group is a function of moral maturity, it may also be suggested that the converse is true; that group experiences foster cooperation, thereby stimulating social as well as moral growth.

Deutsch and Gerard (1955) suggested that social and cognitive change result from group influence. This influence assumes two forms; normative influence or pressure to conform, and information influence in which knowledge, opinions and attitude are shared. Their research with New York University students substantiated the findings of Asch's (1956) famous study which indicated that normative influence impacts on individual judgment. Deutsch and Gerard's investigation went further than Asch's research, however, by evaluating the influence of pooled information and by comparing normative influence with informational influence. Unlike Asch's, this study showed that normative influence may be beneficial to individual growth because it
capitalizes on social conscience and self-respect. These researchers also recognized the power of informational influence and pointed out its potential for stimulating creative individual, as well as group, thinking.

Zaleznik and Moment (1964) and Collins and Guetzkow (1964) independently conducted research which compared individual thinking with group decision-making. Both teams of researchers found that groups work harder and are more productive than individual problem solvers. Zaleznik and Moment called this "psychological interdependence" while Collins and Guetzkow named it the "assembly effect", but both research teams were referring to the phenomenon in which group thinking is greater than any individual member would be expected to produce. This enhanced reasoning by groups is due to the information sharing and cognitive stimulation which Deutsch and Gerard (1955) called informational influence.

Dewey (1897) and Piaget (1932) established that problem solving activities are beneficial to cognitive growth. Kohlberg (1976) agreed and extended this concept to cover moral growth. Deutsch and Gerard (1955) claimed that group problem solving not only is more effective but also has a positive effect on the individual. Zaleznik and Moment (1964) and Collins and Guetzkow (1964) proposed that group problem solving is superior to that which any individual member can produce.

It has been proposed by Zaleznik and Moment (1964)
that the effectiveness and effect of group problem solving may be facilitated by group goals as well as by group process. This research team suggested that group involvement enhances, and is enhanced by, problem solving activities. They also pointed out the importance of the group process in that member interest, group involvement and group interaction are interdependent. The interest of individuals sparks involvement in the group which in turn activates group interaction and keeps individuals interested. Zaleznik and Moment continued their theory with the notion that group involvement is both a function of group process as well as a function of group goals. Group problem solving leads to an ultimate decision and the intensity to which the group attempts to agree upon a decision affects the group's interaction. Complete agreement upon a decision is consensus.

Consensus implied not just agreement with, but commitment to the decision reached. The phenomenon of consensus indicates that the group has explored all the alternatives and has exhausted all possible solutions it can identify before designating one as the optimum decision. Zaleznik and Moment (1964), Beisecker (1969) and Torrance (1957) and others theorized that the attempt to reach consensus induces conflict and conflict not only produces better, more creative ideas and solutions, but also facilitates the state of consensus which is sought. Again, we find an interdependent relationship between group process
and group goals.

Conflict arising from group interaction leads to consensus. Beisecker (1967) discovered that as conflict over issues increases, so does activity within the group which brings about greater effort to reach a solution ultimately leading to consensus. Hoffman, Harburg and Maier (1962) implied that it is the conflict which causes groups to strive for more alternatives and which, thereby, improves the quality of the group decision. Just as interpersonal conflict serves as a stimulus to critical and creative thinking, it also produces intrapersonal conflict or disequilibrium which in turn stimulates cognitive and moral development.

In 1957, Torrance investigated the relationship between group decision-making and disagreement or conflict and found that conflict is a precursor to consensus. He established a link between consensus and conflict when he proposed that the greater the need for consensus, the greater the conflict stimulated. He also stated that high levels of predecision conflict lead to high levels of consensus. Festinger (1954) suggested that groups, like individuals, strive to reduce conflict, seeking all alternatives to achieve resolution or consensus, therefore, exploring more and better options. Horowitz (1962) analyzed consensus, conflict and cooperation and suggested that consensus is the ultimate form of cooperation since each individual in the group must not just tolerate one
another's differences, but must also abolish those differences in order to adopt a consensual solution.

The above studies have demonstrated that group interaction has an effect upon the individual by providing the role-taking opportunities which stimulate cognitive disequilibrium. This inner conflict leads to cognitive change and the opinions of peers both provide information and influence thinking.

Perry (1970) showed that college students vary in levels of moral reasoning and Turiel (1966) indicated that individuals are influenced by reasoning one stage above their own. It may be postulated that there are principled thinkers as well as conventional thinkers within any group of college students and that given group dilemma solving activities, the conventional thinkers may be elevated to principled reasoning. This research is predicated on the "plus one" influence of peers in combination with group interaction which provides role-taking opportunities and stimulates the inner conflict which leads to cognitive change. The moral development of discussion groups may be influenced by these conditions. Similarly, the type of group interaction may have an effect on the degree of moral development.

The research reviewed indicates that consensus seeking discussions are more likely to stimulate conflict than are other types of discussions. Therefore, it may be hypothesized that consensus seeking group discussions
produce more conflict and cognitive disequilibrium than do discussions which remain open-ended. The increased level of disequilibrium may facilitate greater cognitive moral change within the members of a discussion group which seeks consensus than within participants of a discussion group which does not. In addition, members of discussion groups may experience greater moral growth than students who do not participate in group dilemma discussions.

Dental hygiene students, like other college students, display varying levels of moral reasoning. Based on the "plus-one" influence, peer group interaction ought to produce results similar to those predicted for any other college student group. It may be expected, therefore, that within the experimental groups, the principled thinkers will influence and elevate the reasoning of the others. It may be hypothesized further that those experiencing consensus seeking group discussions will change more readily than those who experience open-ended discussions; and that dental hygiene students who participate in classroom discussions will display greater moral maturity than dental hygiene students who do not experience in-class group discussions.

Dental Hygiene Education

Dental Hygiene education spans three quarters of a century, with the first training program having been initiated in Bridgeport, Connecticut, by Dr. A. C. Fones in 1913. Dr. Fones devised a one-year curriculum designed to
teach young women the skills needed to administer oral prophylaxis and oral health education to the school children of Bridgeport (Motley, 1976). Since the initiation of the Fones School in 1913, there have been approximately 200 schools and programs of dental hygiene established throughout the U.S., and the extent of training has expanded to a minimum of two years. There are programs in most states and Puerto Rico.

In spite of the fact that the accreditation requirements mandate that ethical issues be addressed by the curriculum, the Curriculum Guidelines for Dental Hygiene Education, published by the American Dental Hygienists' Association, presently do not provide objectives or strategies which are designed to foster moral development.

No empirical research could be found which addressed the moral development of dental hygiene students, per se. However, one study was found which investigated the use of role-playing and values clarification as a learning strategy with dental hygiene students. Shefrin (1977) reported the use of role-playing in conjunction with a values clarification exercise in which students were encouraged to explore their values toward future careers. While behavioral objectives were not defined and results were measured by subjective student comments regarding the experience, Shefrin found that students felt positively about the role-playing experiences.

In view of the lack of research and guidelines
addressing the moral development of dental hygiene students, the goal of this study is to present a teaching model and empirical evidence regarding its effectiveness to the designers of the *Curriculum Guidelines for Dental Hygiene Education* in the hope that moral education may soon become a standard part of dental hygiene curricula throughout the country.

**Summary**

Research reviewed in this chapter indicates the efficacy of group discussions of dilemma stories as a method of instruction which promotes moral growth. This finding suggests an answer to the first question raised by this research which asks whether small group discussions of moral dilemmas can affect the level of moral development of dental hygiene students.

Research on group process indicates that consensus and conflict are interdependent. Therefore, consensus seeking will raise conflict as conflict leads to consensus. As the level of conflict experienced by the group elevates, interest and interaction also increase, producing better thinking by the individuals within the group. This leads to the second hypothesis presented by this study which suggests that consensus seeking group discussions of moral dilemmas may enhance the moral judgment of dental hygiene students more effectively than do open-ended discussions.
CHAPTER III
METHODODOLOGY

The purpose of this study was to determine whether in-class, peer group discussions of relevant ethical dilemmas stimulate moral development in dental hygiene students. Furthermore, this study was conducted to identify which type of peer group interaction, open-ended or consensus seeking discussion, is more effective in enhancing the moral judgment of dental hygiene students.

Population and Selection of the Sample

The population of interest is all dental hygiene students. The sample chosen for this study was an available sample consisting of intact groups of first year dental hygiene students enrolled in programs at Old Dominion University and Idaho State University. The treatment group consisted of 40 students enrolled in a required course in ethics and professionalism at Old Dominion University. The control group was comprised of 28 first-year dental hygiene students enrolled at Idaho State University, not pursuing a course which teaches ethical thinking. While the control group was nonequivalent in nature, as well as disparate in geographical location, the students enrolled in the control group were similar to the treatment group in many major
attributes.

All students in the study were white females, between the ages of 19 and 37; having similar socioeconomic and educational backgrounds. The group mean scores on the Dental Hygiene Aptitude Test (DHAT), a required examination for entrance into both programs, were found to be statistically similar.

Since age has been found to correlate positively with moral judgment (Kohlberg, 1973), the age of the control group was compared to that of the treatment group. The Idaho State University dental hygiene students had a mean age of 22.2 years with a standard deviation of 3.5 and a range of 20 to 37 years, while the Old Dominion University dental hygiene class had a mean age of 21.2 years with a standard deviation of 3.2 and a range from 19 to 36 years of age. Using an analysis of variance, the difference in mean age between these groups was found not to be statistically significant at the .05 level. The results of this analysis are shown in Table 1.

Idaho State University is an urban co-educational, state-supported, regionally accredited university requiring a composite Scholastic Aptitude Test score of 850 for entrance (Lovejoy, 1979). Old Dominion University also is an urban, co-educational, state-controlled, regionally accredited university requiring a composite SAT score of 850 for admission. While Idaho State University serves slightly less than half as many students as Old Dominion
Table 1
Summary of Analysis of Variance of Age for Experimental Group (ODU Students) and Control Group (ISU Students)

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>Degrees of Freedom</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1.311</td>
<td>1</td>
<td>1.311</td>
<td>0.477</td>
<td>.4923 NS</td>
</tr>
<tr>
<td>Within Groups</td>
<td>181.454</td>
<td>66</td>
<td>2.749</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Eta = 0.0847  Eta Squared = 0.0072
University, both institutions are similar in the type of student which they attract and the type of programs which they offer. Both institutions enroll a large number of commuter students, charge similar tuition fees and offer a number of technical and professional programs (Lovejoy, 1979).

The DHAT served as a second measure of comparability of the two dental hygiene groups. The DHAT which was developed by the American Dental Hygienists' Association Dental Hygiene Aptitude Testing Program in 1956 to serve as an aid to dental hygiene admissions committees, has a reliability range from .82 to .91 (ADHA, 1976). This scholastic test is similar in many ways to both the American College Test (ACT) and the Scholastic Aptitude Test (SAT); however, since it was designed specifically for and is routinely administered to aspiring dental hygiene students, it is especially useful for comparing student and prospective student dental hygienists.

The test has four parts: testing candidates' abilities with science, verbal and numerical concepts and skills as well as reading comprehension. The scores which range from -1 to +9 in each area are then compared with scores achieved by successful dental hygiene candidates throughout the nation rather than with all test-takers. This makes these test scores a sensitive index for comparing dental hygiene students. The raw DHAT scores for each group were compared by an analysis of variance and found to be statistically similar. The results of these analyses are
shown in Tables 2-6.

In addition to the parallels drawn between the two institutions, as well as age and DHAT scores comparisons, Ishida (1975) found that nationally dental hygiene students are similar in career aspirations and aptitudes. Johnson (1980) and Sanderlin (1981) compared dental hygiene students from several schools on the attributes of vocational interest and empathy, respectively, and found that dental hygiene students generally are similar in these characteristics.

From investigations made into the general nature of Idaho State University and Old Dominion University, as well as the DHAT scores and age comparisons and additional supporting studies, it may be stated that while these two groups of first-year dental hygiene students technically were considered nonequivalent, they are quite similar in many characteristics.

Procedures

There were two treatment groups, open-ended and consensus seeking discussion, and one nonequivalent control group. The experimental group was comprised of the intact class of Old Dominion University first-year dental hygiene students enrolled in a required course in ethics and professionalism. There were 40 students in the class who were randomly assigned to a discussion group: open-ended or consensus seeking.

Each treatment group had 20 members who divided into small groups of five each to address accounts of dilemmas
Table 2

Comparison of Mean Value and Standard Deviations of DHAT Scores for the Experimental (ODU) and Control Groups (ISU)

<table>
<thead>
<tr>
<th></th>
<th>Science</th>
<th>Verbal</th>
<th>Numerical</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Treatment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>ODU</td>
<td>4.63</td>
<td>1.63</td>
<td>4.90</td>
<td>1.89</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>ISU</td>
<td>4.61</td>
<td>1.69</td>
<td>4.07</td>
<td>1.68</td>
</tr>
</tbody>
</table>
Table 3
Summary of Analysis of Variance of DHAT Science Scores for Experimental Group (ODU Students) and Control Group (ISU Students)

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>Degrees of Freedom</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>0.005</td>
<td>1</td>
<td>0.005</td>
<td>0.002</td>
<td>.9651</td>
</tr>
<tr>
<td>Within Groups</td>
<td>180.054</td>
<td>66</td>
<td>2.728</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Eta = 0.0054         Eta Squared = 0.0000

Table 4
Summary of Analysis of Variance of DHAT Verbal Scores For the Experimental Group and Control Group

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>Degrees of Freedom</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1.311</td>
<td>1</td>
<td>1.311</td>
<td>0.477</td>
<td>.4923</td>
</tr>
<tr>
<td>Within Groups</td>
<td>181.454</td>
<td>66</td>
<td>2.749</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Eta = 0.0847         Eta Squared = 0.0072
### Table 5
Summary of Analysis of Variance of DHAT Numerical Scores For the Experimental Group and Control Group

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>Degrees of Freedom</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1.311</td>
<td>1</td>
<td>1.311</td>
<td>0.477</td>
<td>0.4923</td>
</tr>
<tr>
<td>Within Groups</td>
<td>181.454</td>
<td>66</td>
<td>2.749</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Eta = 0.0847  Eta Squared = 0.0072*

### Table 6
Summary of Analysis of Variance Of DHAT Reading Comprehension Scores For the Experimental Group and Control Group

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>Degrees of Freedom</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>16.120</td>
<td>1</td>
<td>16.120</td>
<td>1.474</td>
<td>0.2290</td>
</tr>
<tr>
<td>Within Groups</td>
<td>721.689</td>
<td>66</td>
<td>10.935</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Eta = 0.1478  Eta Squared = 0.0218*
which are relevant to dental hygiene practitioners and students. The class met for two hours each week for six weeks. During these sessions, each group confronted two dilemmas or cases, with the exception of the first week when the groups were given detailed instructions and presented with one dilemma. The 11 dilemmas used in this study provided a range of moral issues and each case was designed to highlight a different ethical principle (See Appendix A).

Each student in both experimental groups was informed of the research project and signed a consent form prior to completing the assessment instrument (See Appendix B). The students were assured that the completion of the DIT was completely voluntary and would not reflect on their grade. Furthermore, all protocols were coded so that anonymity was maintained. The Protection of Human Subjects Committees at Old Dominion University and the College of William and Mary were advised of this investigation and granted approval for the research.

Both treatment groups attended class at the same hour but reported to different, side-by-side classrooms. Each group was monitored by a teaching assistant who presented the dilemmas in written form to each student in her charge. The teaching assistant also gave instructions and maintained an attendance record and control. The groups interacted freely with little input from the teaching assistants and none from the researcher. The groups were given approximately one hour to address each dilemma.
The students in the experimental group were familiar with group process prior to the beginning of this study and were accustomed to consensus seeking activities. However, the group which was required to strive for consensus was given instructions regarding consensus seeking in order to assure standardized understanding. Appendix C displays the consensus seeking instruction sheet which was distributed to all students in that treatment group.

The open-ended discussion group was reminded that they were not to attempt to come to consensus, but each student was asked to come to a personal decision regarding the dilemma and then to share, justify and thoroughly discuss that decision with their peers.

While the researcher anticipated that the consensus seeking group would require more time to achieve consensus than would the open-ended group, this expectation was not realized and it was found that in most cases it took the open-ended group longer to discuss the dilemma than it did for the consensus seeking group to reach consensus.

The control group consisted of the first year dental hygiene class at Idaho State University. This group did not attend any class teaching ethical content and experienced no formal in-class discussions of ethical dilemmas. This group, however, was enrolled in other dental hygiene courses, clinical and didactic, which presented material similar to that which the experimental group was studying. The purpose of the control group was to rule out
the effect of maturation as well as the possible effect of practitioner/client interaction which might have resulted from the students' introduction to clinical experiences.

Prior to starting the treatment, one-half of each treatment group and one-half of the control group was administered the DIT by random assignment. The treatment extended over a six week period after which each student was asked to complete the DIT as a posttest on her own time and without consultation with parents, friends or classmates. One month after the completion of the treatment, during which no formal interaction occurred, the students were again requested to individually complete the DIT. Of the experimental group, 38 students completed the entire protocol while in the control group 24 students completed the entire protocol.

Permission to use the DIT as the assessment instrument for this study was sought and obtained from the author, Dr. James Rest, Professor of Social, Psychological and Philosophical Foundations of Education at the University of Minnesota.

Instrumentation

The dependent variable in this research was a measure of moral judgment as presented by the DIT. **Opinions About Social Problems** known as the Defining Issues Test (DIT) by James Rest, consists of six sociomoral dilemma stories, a suggested action and a series of twelve
statements which identify issues or questions relevant to each case. The subject is asked to read the story, decide whether the action is appropriate and to rank the questions according to relative importance.

The DIT is designed to be completed independently by checking a series of boxes, and requires approximately 45 minutes for completion. This instrument focuses on the reasons or issues chosen by the subject and identifies the level of sophisticated moral thinking which has been attained, yielding a principled reasoning or P index which represents the degree to which the individual is reasoning at stages 5 or 6 based upon Kohlberg's six-stage hierarchy of moral judgment. While the P index only identifies the affinity for principled thinking rather than determining the level of moral reasoning per se, it is an appropriate instrument for use with this college student population since it is the facilitation of principled thinking which is the goal of this intervention study (See Appendix D).

Rest (1979a) designed the DIT to categorize thinking according to Kohlberg's hierarchy and like Kohlberg's Moral Maturity Index, to assess peoples' understanding of the dilemma, not just the appropriateness of a suggested action. Rest found that in comparing the two indices, the DIT correlates at .75 with the MMI and has a two-week test/retest stability of .81. Rest claims construct validity for the DIT and documents numerous studies conducted using the DIT over the past decade.
In addition to test/retest stability, the DIT has been shown to be "fake" proof. In 1975, McGeorge set out to determine if the DIT could be fooled by subjects who purposely answered the survey with reasoning either above or below their own ability. He asked one group of subjects to "fake good" on the DIT while another group was told to "fake bad". Each group also completed the DIT under normal circumstances in order to establish a baseline. McGeorge found that the subjects were able to respond to the DIT displaying a lower level moral thinking but were unable to mimic a higher level. This finding corresponds with Kohlberg's assumption that moral reasoning is developmental since one could always return to a lower or earlier stage of reasoning but would be unable to comprehend and therefore, feign a higher stage. Bloom (1977) conducted a similar, repeated measure study with 132 William and Mary graduate students. Bloom's findings agree with McGeorge's and helped to establish that the DIT is reliable under repeated test conditions and also is resistant to faking.

The DIT is constructed with a consistency check so that the reliability of the subjects' answers can be validated. If an individual protocol displays inconsistencies in ranking issues or selecting the important questions, it may be an indication of inattention to the test and the protocol is quickly identified and eliminated. In the experimental group there were two protocols which were eliminated on this basis and six in the control group.
The DIT is easily scored by hand, using a scoring key, and a P score may be assigned to a protocol in approximately 30 minutes. All correctly completed DIT protocols for the three groups were hand scored by the researcher. The number of subjects who had complied with the research methods and completed all DIT's correctly for each group equalled 18; therefore, the total number of subjects in this investigation equalled 54.

Design

The research design followed by this study was a modification of the nonequivalent control group design designated as Design 10 by Campbell and Stanley (1963). The experimental group consisted of an intact class which was randomly assigned to one of two treatments. A similar intact class was employed as a nonequivalent control group in order to insure internal validity by controlling for the effects of history, maturation, testing and instrumentation.

The experimental and control groups were compared on the attributes of age, race, sex and cognitive ability and found to be statistically similar. A pretest was administered randomly to one-half of each group and a posttest and follow-up test were administered to the entire membership of each group. The follow-up test was added in order to determine the lasting effect or delayed action of the treatments.

The purpose of this research was to determine if the dilemma discussion/peer interaction strategy would produce a
positive change in the moral judgment of the experimental group. The dilemma story method was administered to both treatment groups and these groups were compared to the control group. In addition, a different type of peer interaction was assigned to each of the two treatment groups; and these groups were then compared to assert which peer interaction was more effective in stimulating moral development.

The dependent variable in this study was the moral judgment of the subjects, demonstrated by a principled reasoning score (P Score), as measured by the DIT. The independent variables were the dilemma discussion process and the type of peer interaction or group discussion, either open-ended or consensus seeking.

The groups were compared on mean posttest scores and mean follow-up scores as well as on the mean change between posttest and follow-up scores. The research design may be depicted in the following way:

\[
\begin{array}{cccc}
O_1 & X_1 & O_4 & O_7 \\
R & \sim &  \\
O_2 & X_2 & O_5 & O_8 \\
\end{array}
\]

\[
\begin{array}{cccc}
O_3 & \sim X_3 & O_6 & O_9 \\
0_{1-3} & \text{pretest to } \frac{1}{2} \text{ of each group}; 0_{4-6} & \text{posttest}; 0_{7-9} & \text{follow-up}; X_1 & \text{open-ended discussion}; X_2 & \text{consensus seeking}; \text{and } X_3 & \text{no treatment.}
\end{array}
\]
Statistical Methods

The P score produced by the DIT is representative of stage 5 and 6 thinking as described by Kohlberg. Fifty-four subjects correctly completed all phases of the research protocol; 18 in each group (See Appendix E).

In order to test whether the dilemma discussion method had an effect on moral judgment, the mean P score achieved on the posttest and follow-up tests by both treatment groups were compared with the mean P score obtained for the control group by analysis of variance followed by an a priori orthogonal contrast. A similar analysis was conducted on the mean change in posttest to follow-up scores. The formula used for the a priori orthogonal contrast was

$$\frac{1}{4}X_1 + \frac{3}{2}X_2 - X_3 = 0,$$

with $X_1$ representing the open-ended discussion group, $X_2$ representing the consensus seeking discussion group and $X_3$ representing the control group.

The comparative effectiveness of the two types of peer interaction or group discussion was tested by an analysis of variance with an a priori orthogonal contrast of the scores on the posttest and follow-up tests achieved by the two treatment groups. A comparison also was made of the change in scores between the posttest and follow-up test for these two groups. The orthogonal weights assigned to the two groups were 1 and -1 yielding the following formula:

$$1X_1 - 1X_2 = 0.$$

Not all subjects were pretested; therefore, a
comparison of the change in mean scores, pre- to posttest and pre- to follow-up test, could not be made for total groups. However, this comparison was drawn for that portion of each group which did take the pretest. The mean changes in score from pre- to posttest and pre- to follow-up test, for one-half of each treatment group and one-half of the control group were compared statistically by a series of t-tests.

In order to determine if the entering level of principled thinking had a significant effect on the outcome of the post- and follow-up test scores, several statistical tests were performed. An analysis of variance of pretest scores was conducted to establish if there were any differences among the groups prior to the experiment. A series of analyses of covariance, with pretest scores as covariates, were administered to ascertain the relationship between the pretest score and the post- and follow-up test scores.

**Hypotheses**

This investigation was conducted to determine the effects of the dilemma discussion method as well as the comparative effects of the type of peer interaction on moral judgment as measured by the DIT. The level of moral judgment ultimately attained, as well as the change produced by the treatments, were pertinent to this research. The following hypotheses were designed to test anticipated differences between the treatment groups and the control
group as well as differences between the two treatment
groups with respect to moral judgment:

\[ H_1: \frac{1}{2}X_1 + \frac{1}{2}X_2 > X_3 \]

\[ H_2: X_2 > X_1 \]

\[ H_3: \frac{1}{2}U_1 + \frac{1}{2}U_2 > U_3 \]

\[ H_4: \text{There will be a significantly greater positive} \]

mean change in posttest to follow-up scores as
measured by the DIT in the consensus seeking
group \((U_2)\) than in the open-ended group \((U_1)\).

\[ H_4 : U_2 > U_1 \]

**Summary**

The purpose of this research was to validate the
dilemma discussion method as an appropriate teaching
strategy for raising the level of moral reasoning of dental
hygiene students. In addition, two types of peer interaction
or group process were compared to determine which was more
effective in stimulating moral development. Since the
population of interest is student dental hygienists, two
intact, first-year dental hygiene classes were chosen as
subjects. The experimental group was randomly assigned to
treatments consisting of two types of group process, open-
ended and consensus seeking. The control group received no
treatment but was exposed to didactic and clinical courses
with content and requirements similar to those experienced
by the experimental group.

All groups were pretested (partially), post- and
follow-up tested. The scores obtained from the post- and
follow-up tests, as well as the change in score from posttest
to follow-up, were compared to determine differences in moral
judgment as measured by the DIT between the treatment groups
and the control group as well as to compare the two treatment
groups. Analyses of variance with a priori orthogonal
contrasts were conducted on the DIT scores to identify any
statistical differences between groups.

These procedures were carried out in order to establish the relationship between in-class group discussions of moral dilemmas and enhancement of moral judgment. Also of interest was the type of peer group interaction that is more effective in stimulating moral development. The strength of these relationships were tested empirically and the results are presented, along with nonempirical observations, in Chapter IV.
CHAPTER IV
RESULTS

The major findings of this study are reported in this chapter. The results of content analysis to determine differences in moral judgment between the experimental and control groups is presented first. Change scores are documented and trends are discussed. The differences found between the pretest, posttest and follow-up results are highlighted. Next, the four major hypotheses are presented in the null form along with the results of the statistical tests conducted for each null hypothesis, accompanied by tables. The chapter concludes with a summary of major findings.

Content Analysis

Two major comparisons of data were made. The first comparison was of group mean posttest and follow-up scores, followed by a comparison of the change in score from posttest to follow-up. The two treatment groups were compared with the control group to test the effectiveness of the dilemma discussion method, and then compared with each other to test the relative effectiveness of the group processes.

The mean posttest score for the open-ended discussion group was 43.74 with a standard deviation of 15.6. The mean
The posttest score of the consensus seeking discussion group was found to be 47.40 with a standard deviation of 10.2. The scores of the two treatment groups were combined to yield a mean posttest score for the experimental group of 45.57 with a standard deviation of 13.1. This was compared to the mean posttest score of the control group which was 40.55 with a standard deviation of 13.9 (See Table 7).

While the mean posttest P score of the consensus seeking group was 3.66 points higher than the open-ended group and the mean score of the combined treatment groups exceeded the mean score of the control group by 5.02, these differences were found to be nonsignificant when subjected to a one-way analysis of variance (See Table 8). The mean follow-up test score for the open-ended discussion group was 44.17 with a standard deviation of 14.6; and the mean follow-up P score for the consensus seeking discussion group was 49.82 with a standard deviation of 13.5. These scores combined to give a mean follow-up P score for the experimental group of 46.99 with a standard deviation of 14.1, while the control group presented a mean follow-up test score of 41.18 with standard deviation of 12.0 (See Table 9). The mean P score of the consensus seeking group exceeded that of the open-ended group by 5.65 and that of the combined treatment groups exceeded the control group by 5.81. These differences were greater than the differences in the posttest scores; however, they remained nonsignificant when tested by a one-way analysis of variance (See Table 10).
Table 7

Comparison of Mean Values and Standard Deviations of Posttest Scores for Experimental and Control Groups

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Number</th>
<th>Mean of Posttest Scores</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open-ended</td>
<td>18</td>
<td>43.74</td>
<td>15.64</td>
</tr>
<tr>
<td>Consensus Seeking</td>
<td>18</td>
<td>47.40</td>
<td>10.16</td>
</tr>
<tr>
<td>Mean for Experimental Groups</td>
<td>36</td>
<td>45.57</td>
<td>13.13</td>
</tr>
<tr>
<td>Control Group</td>
<td>18</td>
<td>40.55</td>
<td>13.85</td>
</tr>
</tbody>
</table>
Table 8

Summary of One-way Analysis of Variance of Posttest Scores for Experimental and Control Groups

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>F Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>423.275</td>
<td>211.637</td>
<td>1.176</td>
<td>0.3167 NS</td>
</tr>
<tr>
<td>Within Groups</td>
<td>51</td>
<td>9176.484</td>
<td>179.931</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>9599.758</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 9

Comparison of Mean Values and Standard Deviations of Follow-up P Scores for Experimental and Control Groups

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Number</th>
<th>Mean of Follow-up Scores</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open-ended</td>
<td>18</td>
<td>44.17</td>
<td>14.60</td>
</tr>
<tr>
<td>Consensus Seeking</td>
<td>18</td>
<td>49.82</td>
<td>13.48</td>
</tr>
<tr>
<td>Mean For Experimental Groups</td>
<td>36</td>
<td>46.99</td>
<td>14.14</td>
</tr>
<tr>
<td>Control Group</td>
<td>18</td>
<td>41.18</td>
<td>12.02</td>
</tr>
</tbody>
</table>
Table 10

Summary of One-way Analysis of Variance of Follow-up Scores for Experimental and Control Groups

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>F Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Group</td>
<td>2</td>
<td>692.049</td>
<td>346.024</td>
<td>1.925</td>
<td>0.1564</td>
</tr>
<tr>
<td>Within Group</td>
<td>51</td>
<td>9168.584</td>
<td>179.776</td>
<td></td>
<td>NS</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>9860.633</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In reviewing the data for indications of trends, changes between posttest and follow-up test scores were analyzed. There was a positive change of .43 points in the scores of the open-ended discussion group, a .63 point positive change in the control group and a 2.41 point positive change in the consensus seeking group. When submitted to an analysis of variance, which is summarized in Table 11, these change scores were found to be nonsignificant; however, they did present a trend which indicated that there was greater growth in moral judgment in the consensus seeking group than either of the other two groups. It was also interesting that the change in the open-ended discussion group and the control group were quite similar.

While no statistically significant differences were found among the groups on the posttest, follow-up or change scores, the groups may be nonstatistically compared. The consensus seeking group had the largest mean posttest and mean follow-up scores of any group, followed by the open-ended discussion group and then by the control group. In addition, the consensus seeking group had the largest positive change in mean scores with the control group and the open-ended discussion group having considerably smaller and very similar positive change in mean scores (See Figure 1). These nonstatistical findings may indicate that the consensus seeking group was slightly superior in moral reasoning and moral development to the other two groups. Since the posttest and follow-up scores of the combined treatment
Table 11
Summary of Analysis of Variance of Change in Score Posttest to Follow-up for Experimental and Control Groups

<table>
<thead>
<tr>
<th>Source of Degrees of Variance</th>
<th>Freedom</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>Level of Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Group</td>
<td>2</td>
<td>42.842</td>
<td>21.421</td>
<td>0.132</td>
<td>.8766 NS</td>
</tr>
<tr>
<td>Within Group</td>
<td>51</td>
<td>8272.145</td>
<td>162.199</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>8314.987</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$\eta = 0.0718 \quad \eta^2 = 0.0052$
Figure 1  Change in Mean Value From Posttest to Follow-up Scores For Experimental and Control Groups
groups were higher than the control group, it may be postulated that the two treatment groups displayed higher levels of moral thinking than did the control group.

In reviewing the raw data presented in Appendix E, it may be observed that only one-half of each group took the pretest; therefore, each group was divided into two subgroups, pretested and not pretested subjects. The mean posttest score of the pretested, open-ended subgroup was 40.74 while the not pretested subgroup was 46.74. The pretested consensus seeking subgroup's mean posttest score was 47.22 while the not pretested consensus seeking subgroup's mean posttest score was 47.59. The mean posttest score of the pretested subgroup of the control group was 43.41 while the score of the not pretested subgroup was 37.78.

The mean follow-up scores of the pretested and not pretested groups were: open-ended pretested group - 40.19, not pretest group - 48.15; consensus seeking pretested group - 50.19, not pretested group 49.44; and pretested control group - 38.28, not pretested control group - 44.08.

Table 12 and 13 present these data and it may be noted that there is no consistent pattern between level of score and pretested or not pretested status. This suggests that there is no relationship between the act of taking the pretest and the posttest or follow-up scores.

While only one-half of each group was pretested, the scores of the pretested subgroups became a source of information on the comparibility of the groups prior to treatment.
Table 12
Summary of the Mean Values of the Posttest Scores of the Pretested and Not Pretested Subgroups Within Each Group

<table>
<thead>
<tr>
<th></th>
<th>Open-ended</th>
<th>Consensus Seeking</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretested</td>
<td>40.74 (9)</td>
<td>47.22 (9)</td>
<td>43.41 (9)</td>
</tr>
<tr>
<td>Not Pretested</td>
<td>46.74 (9)</td>
<td>47.59 (9)</td>
<td>37.78 (9)</td>
</tr>
<tr>
<td>Column Mean</td>
<td>43.74 (18)</td>
<td>47.40 (18)</td>
<td>40.60 (9)</td>
</tr>
</tbody>
</table>

Table 13
Summary of the Mean Values of the Follow-up Test Scores of the Pretested and Not Pretested Subgroups With Each Group

<table>
<thead>
<tr>
<th></th>
<th>Open-ended</th>
<th>Consensus Seeking</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretested</td>
<td>40.19 (9)</td>
<td>50.19 (9)</td>
<td>38.28 (9)</td>
</tr>
<tr>
<td>Not Pretested</td>
<td>48.15 (9)</td>
<td>49.44 (9)</td>
<td>44.08 (9)</td>
</tr>
<tr>
<td>Column Mean</td>
<td>44.17 (18)</td>
<td>49.82 (18)</td>
<td>41.18 (18)</td>
</tr>
</tbody>
</table>
as well as regarding the overall change which occurred from pretest to follow-up. The open-ended group had a mean pretest score of 37.67 with a standard deviation of 16.9, the consensus seeking group had a pretest score of 48.15 with a standard deviation of 14.0 while the control group had a mean pretest score of 44.07 with a standard deviation of 11.7. The differences in these scores are noticeable; however, when statistically tested by an analysis of variance, the resulting F ratio of 1.22 was not significant at the .05 level (See Table 14). It may be stated, therefore, that the three groups were similar prior to initiation of the treatments.

The changes in scores from the pretest to posttest, posttest to follow-up and the overall change from pretest to follow-up for each pretested subgroup are displayed in Figure 2. The pretest to posttest change for the control group was -.7, while the open-ended group gained 3.1 points and the consensus seeking group lost 1 point. The differences in these changes were statistically analyzed by a t-test and not found to be significant at the .05 level (See Table 15).

The loss in points in the consensus seeking group and the control group may be attributed to the college experience which seems to lead to retrogression to an earlier level of moral reasoning. This phenomenon was documented in reports by Perry (1970) as well as Kohlberg and Kramer (1967). The gain in points demonstrated by the
### Table 14

Summary of the Analysis of Variance of Pretest Scores

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>Level of Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>502.60</td>
<td>251.30</td>
<td>1.22</td>
<td>0.31 NS</td>
</tr>
<tr>
<td>Within Groups</td>
<td>24</td>
<td>4950.27</td>
<td>206.26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>5452.87</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 2: Change in Mean Value P Scores (Pretested Subgroup Only)
Table 15
Summary of the Means And T-Test Values Of the Change in Scores For The Experimental and Control Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Mean</th>
<th>T Value</th>
<th>Degrees Of Freedom</th>
<th>Two Tailed Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined Treatment</td>
<td>18</td>
<td>1.07</td>
<td>0.39</td>
<td>25</td>
<td>0.697 NS</td>
</tr>
<tr>
<td>Control</td>
<td>9</td>
<td>-0.67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open-ended</td>
<td>9</td>
<td>3.07</td>
<td>0.53</td>
<td>10</td>
<td>0.609 NS</td>
</tr>
<tr>
<td>Consensus Seeking</td>
<td>9</td>
<td>-0.92</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Mean</th>
<th>T Value</th>
<th>Degrees Of Freedom</th>
<th>Two Tailed Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined Treatment</td>
<td>18</td>
<td>2.28</td>
<td>2.04</td>
<td>25</td>
<td>0.052*</td>
</tr>
<tr>
<td>Control</td>
<td>9</td>
<td>-5.78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open-ended</td>
<td>9</td>
<td>2.52</td>
<td>0.07</td>
<td>16</td>
<td>0.942 NS</td>
</tr>
<tr>
<td>Consensus Seeking</td>
<td>9</td>
<td>2.04</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P < .05
open-ended group may be attributed to the treatment which gave students an opportunity to engage in moral reasoning and group interaction. The consensus seeking group may have regressed while the open-ended group gained because of the nature of the interaction. It was predicted that the consensus seeking exercises would cause cognitive disequilibrium, which the students may have been experiencing at the time of the posttest. This conflict could have been the first step to change in moral thinking; therefore, the posttest to follow-up changes in scores were examined.

The control group continued the trend of loss in points. A loss of 5.1 points was observed between the posttest and the follow-up test for the control group. The open-ended group ended the gain and began a downward trend, loosing .6 points between the post- and follow-up tests. The consensus seeking group reversed an earlier loosing trend and gained 3 points between the post- and follow-up test indicating that the consensus seeking discussions may have a delayed action effect. In order to determine the long range effect of the experiment, the overall changes in scores were observed and analyzed.

The change from pre- to follow-up test for the control group was a loss of 5.8 points while there was a gain of 2.52 points for the open-ended group and a 2 point gain for the consensus seeking group. To compare statistically the overall changes in scores, a series of t-tests were conducted. The differences in overall change scores between the two
treatment groups were not found to be statistically significant. However, the differences in change in scores from pre- to follow-up test between the combined treatment groups and the control group were found to be statistically significant at the .05 level (See Table 15). This may indicate that the dilemma discussion method did make a difference in the moral reasoning of the pretested subgroup.

In comparing the graph displaying scores of the pretested groups with that showing total groups' progress, some interesting differences may be observed. In looking at trends among the total groups, it can be seen that in the change from post- to follow-up test scores, the control group and the open-ended group have very similar gains, .63 and .43 respectively, while the consensus seeking group gained 2.41 (See Figure 1). In reviewing the progress of the pretested subgroups as shown in Figure 2, a constant downward trend with an overall loss of 5.8 points is apparent for the control group while the open-ended group had an overall gain of 2.52 points and the consensus seeking group had an overall gain of 2 points. When Figure 1 and Figure 2 are reviewed together, it may be observed that the control group was the least likely to progress in moral reasoning and the two treatment groups progressed at different times during the experiment. The open-ended group displayed greater improvement during the treatment phase while the consensus seeking group advanced after treatment, indicating the delayed action and possibly greater potential of the consensus
seeking group process.

Statistical tests did not find the change scores from post- to follow-up test to be significantly different; however, the overall change from pre- to follow-up test for the pretested subgroup was significantly different when comparing the experimental group with the control group. This difference in the change in scores may indicate that the dilemma discussion method was effective in raising the level of moral reasoning of the experimental group.

Even though no statistical differences were found among groups on the pretest scores, the relationship between the pretest scores and the change in scores from pre- to posttest and pre- to follow-up test, and the differences between posttest and follow-up scores among groups were studied by a series of analyses of covariance with pretest scores as covariates. These analyses indicated that there was a significant relationship between the pretest scores and the posttest, follow-up scores, and on the change in scores from pre- to posttest as well as from pre- to follow-up test. In every case, the source of variation was found to be significant for the pretest score, but not for the main effect of the treatment (See Tables 16 - 19).

In addition to reviewing DIT scores as a source of information regarding the impact of the dilemma story technique, subjective comments were solicited from the students as part of the course evaluation process. In general, comments were favorable and indicated that the students
Table 16
Summary of the Analysis of Covariance of Posttest Scores for Experimental and Control Groups With the Pretest Scores as Covariates

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Value</th>
<th>Significance of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate (Pretest Score)</td>
<td>1</td>
<td>1051.77</td>
<td>1051.7</td>
<td>8.320</td>
<td>0.008*</td>
</tr>
<tr>
<td>Main Effects (Open-ended, consensus seeking, or no treatment)</td>
<td>2</td>
<td>24.30</td>
<td>12.15</td>
<td>0.096</td>
<td>0.909 NS</td>
</tr>
<tr>
<td>Explained</td>
<td>3</td>
<td>1076.07</td>
<td>358.69</td>
<td>2.837</td>
<td>0.060</td>
</tr>
<tr>
<td>Residual</td>
<td>23</td>
<td>2907.60</td>
<td>126.41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>3983.67</td>
<td>153.22</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P < .05
Table 17
Summary of the Analysis of Covariance of Follow-up Scores
For Experimental and Control Groups With
Pretest Scores as Covariates

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Value</th>
<th>Significance of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate (Pretest Score)</td>
<td>1</td>
<td>1846.26</td>
<td>1846.26</td>
<td>17.03</td>
<td>0.000*</td>
</tr>
<tr>
<td>Main Effects (Open-ended, consensus seeking, or no treatment)</td>
<td>2</td>
<td>416.20</td>
<td>208.10</td>
<td>17.03</td>
<td>0.17 NS</td>
</tr>
<tr>
<td>Explained</td>
<td>3</td>
<td>2262.46</td>
<td>754.15</td>
<td>1.92</td>
<td>0.002*</td>
</tr>
<tr>
<td>Residual</td>
<td>23</td>
<td>2494.23</td>
<td>108.45</td>
<td>6.95</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>4756.69</td>
<td>182.95</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P < .05
Table 18
Summary of the Analysis of Covariance of Change in P Scores
From Pre- to Posttest For Experimental and Control Groups With Pretest Scores as Covariates

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Value</th>
<th>Significance of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate (Pretest Scores)</td>
<td>1</td>
<td>1715.00</td>
<td>1715.00</td>
<td>13.57</td>
<td>0.001*</td>
</tr>
<tr>
<td>Main Effects (Open-ended, consensus seeking, or no treatment)</td>
<td>2</td>
<td>24.30</td>
<td>12.15</td>
<td>0.10</td>
<td>0.909 NS</td>
</tr>
<tr>
<td>Explained</td>
<td>3</td>
<td>1739.30</td>
<td>579.77</td>
<td>4.59</td>
<td>0.012*</td>
</tr>
<tr>
<td>Residual</td>
<td>23</td>
<td>2907.60</td>
<td>126.42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>4646.90</td>
<td>178.73</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P < .05
Table 19

Summary of the Analysis of Covariance of Change in P Scores From Pre- to Follow-up Test for Experimental and Control Groups With Pretest Scores As Covariates

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Value</th>
<th>Significance of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate (Pretest Scores)</td>
<td>1</td>
<td>953.29</td>
<td>953.29</td>
<td>8.79</td>
<td>0.007*</td>
</tr>
<tr>
<td>Main Effects (Open-ended, consensus seeking, or no treatment)</td>
<td>2</td>
<td>416.20</td>
<td>208.10</td>
<td>1.92</td>
<td>0.170 NS</td>
</tr>
<tr>
<td>Explained</td>
<td>3</td>
<td>1369.49</td>
<td>456.50</td>
<td>4.21</td>
<td>0.016*</td>
</tr>
<tr>
<td>Residual</td>
<td>23</td>
<td>2494.23</td>
<td>108.45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>3863.72</td>
<td>148.61</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P < .05
found the dilemma discussion format more interesting and provocative than would have been a lecture series. Many students displayed a great interest in the dilemma story process and even submitted written accounts of ethical incidents encountered in their own lives. On the whole, student comments were positive and it may be concluded that the dilemma discussion method was successful in raising the moral sensitivity of these students.

Test of Hypotheses

Hypothesis 1 predicted that the treatment groups, open-ended and consensus seeking discussion, would have significantly higher mean posttest and follow-up scores on the DIT than the control group. This statement has been rephrased in the null form for purposes of testing to read: there will be no significant difference between the mean posttest and mean follow-up scores of the combined treatment groups, open-ended \( X_1 \) and consensus seeking \( X_2 \), and the control group \( X_3 \) at the .05 level of confidence. This may be written in formula form: \( \frac{1}{2}X_1 + \frac{1}{2}X_2 - X_3 = 0 \).

This hypothesis was tested by analysis of variance with an a priori orthogonal contrast, a summary of which is presented in Tables 20 and 21. In testing the results of the post- and follow-up tests, if the F ratio had exceeded the critical value of 4.03 at 1 and 51 degrees of freedom, the null hypothesis could have been rejected; however, the resulting F ratios were 1.633 for the posttest and 2.245 for
### Table 20
**Summary of the Analysis of Variance of the Posttest Scores of the Combined Treatment Groups Versus the Control Group Using the Orthogonal Contrast Method**

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparison</td>
<td>1</td>
<td>293.94</td>
<td>293.94</td>
<td>1.6334 NS</td>
</tr>
<tr>
<td>Remainder</td>
<td>1</td>
<td>129.334</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>51</td>
<td>9176.484</td>
<td>179.931</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>53</strong></td>
<td><strong>9599.758</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 21
**Summary of the Analysis of Variance of the Follow-up Scores of the Combined Treatment Groups Versus the Control Group Using the Orthogonal Contrast Method**

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparison</td>
<td>1</td>
<td>403.56</td>
<td>403.56</td>
<td>2.245 NS</td>
</tr>
<tr>
<td>Reminder</td>
<td>1</td>
<td>288.489</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>51</td>
<td>9168.584</td>
<td>179.776</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>53</strong></td>
<td><strong>9860.633</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
the follow-up test. Therefore, the null hypothesis was not rejected. There was no statistically significant difference between the treatment groups and the control group on the post- or follow-up test.

Hypothesis 2 stated that mean post- and mean follow-up test DIT scores of the consensus seeking group would exceed the mean post- and follow-up test scores of the open-ended group. This has been rephrased to read: there will be no significant difference at the .05 level of confidence between the post- and follow-up test scores of the consensus seeking ($X_2$) and the open-ended ($X_1$) discussion groups. Written in formula form, this appears as: $X_2 - X_1 = 0$.

To test this hypothesis, an analysis of variance with an a priori orthogonal contrast was performed and a summary of the results are presented in Tables 22 and 23.

Since the critical value of 4.03 for 1 and 51 degrees of freedom has been established at the .05 level of confidence and the $F$ ratio for the posttest score was 0.6848 and the $F$ ratio for the follow-up test score was found to be 1.570, neither of these $F$ ratios exceeded the critical value. Hypothesis 2 was not rejected. There was no statistically significant difference found between the consensus seeking and the open-ended discussion groups on the post- or follow-up tests.

Hypothesis 3 postulated that there would be a greater positive mean change in post- to follow-up scores on the DIT in the treatment groups, open-ended and consensus
### Table 22

Summary of the Analysis of Variance of the Posttest Scores Of the Open-ended Discussion Group Versus The Consensus Seeking Discussion Group Using the Orthogonal Contrast Method

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparison</td>
<td>1</td>
<td>123.21</td>
<td>123.21</td>
<td>0.6848</td>
</tr>
<tr>
<td>Remainder</td>
<td>1</td>
<td>300.064</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>51</td>
<td>9176.484</td>
<td>179.931</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>9599.758</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 23

Summary of the Analysis of Variance of the Follow-up Scores of the Open-ended Discussion Group Versus the Consensus Seeking Group Using the Orthogonal Contrast Method

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparison</td>
<td>1</td>
<td>282.24</td>
<td>282.24</td>
<td>1.570</td>
</tr>
<tr>
<td>Remainder</td>
<td>1</td>
<td>409.809</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>51</td>
<td>9168.584</td>
<td>179.776</td>
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<tr>
<td>Total</td>
<td>53</td>
<td>9860.633</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
seeking, than in the control group. Restated in the null form, this reads: the mean change in post- to follow-up scores for the treatment groups, open-ended ($U_1$) and consensus seeking ($U_2$), will not be significantly different at the .05 level of confidence from the mean change in scores of the control group ($U_3$). This is depicted by the following formula: $\frac{1}{2}U_1 + \frac{1}{4}U_2 - U_3 = 0$.

To test this hypothesis, an analysis of variance with a priori orthogonal contrast was conducted, the results of which are summarized in Table 24.

The critical value at 1 and 51 degrees of freedom for .05 level of confidence stands at 4.03 while the F ratio for the orthogonal contrast was 0.0488. This F ratio is not in the critical zone, therefore, the null hypothesis may not be rejected. No statistically significant difference was found between the treatment groups and the control group in the mean change in post- to follow-up test scores.

Hypothesis 4 predicted that there would be a significantly greater positive mean change in post- to follow-up scores in the consensus seeking group than in the open-ended group. As stated in the null form, this hypothesis reads: the mean change in post- to follow-up test scores of the consensus seeking group ($U_2$) will not be significantly different from the open-ended ($U_1$) discussion group's mean change in post- to follow-up score at the .05 level of significance. The following formula describes this statement: $U_2 - U_1 = 0$. 
### Table 24

Summary of the Analysis of Variance of the Mean Change Scores Posttest to Follow-up of the Combined Treatment Groups Versus the Control Group Using the Orthogonal Contrast Method

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparison</td>
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<td>7.92</td>
<td>0.0488  NS</td>
</tr>
<tr>
<td>Remainder</td>
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<td>34.922</td>
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<td></td>
</tr>
<tr>
<td>Error</td>
<td>51</td>
<td>8272.145</td>
<td>162.199</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>8314.987</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
An orthogonal contrast following the analysis of variance was conducted and the results are presented in Table 25. The F ratio was found to be 0.218 which did not exceed the critical value of 4.03; therefore, the null hypothesis was not rejected. No statistically significant difference was found at the .05 level, between the consensus seeking and the open-ended group in mean change in post- to follow-up test scores.

Summary of Findings

The primary purpose of this investigation was to establish the efficacy of the dilemma discussion method as a viable technique for raising the level of moral judgment of dental hygiene students. The second objective was to compare the two methods of group process, open-ended and consensus seeking discussions, in their respective effectiveness in stimulating moral development.

The Defining Issues Test was used to identify the subjects' level of moral reasoning; and the resulting posttest, follow-up, and change scores were compared for experimental and control groups as well as for the two treatment groups. In comparing the experimental group with the control group, the mean posttest and follow-up scores of the consensus seeking and open-ended discussion groups were found to be higher, but not significantly higher than the control group. Also, the mean change in score, post-to follow-up test, of the treatment groups were found to
Table 25

Summary of the Analysis of Variance of the Mean Change Scores Posttest to Follow-up of the Open-ended Discussion Group Versus the Consensus Seeking Discussion Group Using the Orthogonal Contrast Method

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparison</td>
<td>1</td>
<td>35.28</td>
<td>35.28</td>
<td>0.218</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NS</td>
</tr>
<tr>
<td>Remainder</td>
<td>1</td>
<td>7.562</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>51</td>
<td>8272.145</td>
<td>162.199</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>8214.987</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
exceed, but not significantly, those of the control group. These findings indicate that the dilemma discussion strategy might have had a positive effect on the experimental group; however, this effect did not attain statistical significance.

When the two treatment groups were compared in an attempt to determine which was more effective, the consensus seeking discussion group generated higher scores on the post- and follow-up tests than did the open-ended discussion group; however, the difference between these scores was not statistically significant. A difference between treatment groups in the change in post- to follow-up test scores was observed, but again, was not significant. While nonempirical observations implied that the consensus seeking discussion method was superior to the open-ended discussion method in stimulating moral development, statistical analyses of these data revealed that there was no difference between the two discussion methods.

When studying the pretested groups only, no statistical differences were found between groups on the pretest measure. Therefore, it may be stated that these groups were similar at the beginning of this investigation. The results of a series of t-tests indicated that there were no statistical differences between groups in change in scores pre- to posttest. However, there was a statistical difference at the .05 level between the combined treatment groups and the control group in the change in score from pretest to follow-up.
In reviewing all the data and the results of the analyses, it may be stated that while there were no statistical differences between any of the total groups, observations suggest that the dilemma discussion method may have a positive effect on moral judgment. Furthermore, in comparing the two types of peer interaction, consensus seeking group discussions seem to be more effective than open-ended discussions in stimulating the moral development of student dental hygienists.
CHAPTER V
Summary and Findings

Educators and psychologists, including Dewey, Piaget, Kohlberg and others, have proposed that moral development is dependent, at least in part, upon environmental conditions and experiences. This includes the opportunity to solve problems, to interact with peers and to experience role-taking activities which result in both interpersonal and intrapersonal conflict. Intrapersonal conflict or cognitive disequilibrium is the first step to cognitive change. Role-taking allows the individual to see the issue from another's perspective, while peer interaction provides feedback and supplies both information and motivation to find solutions.

Intervention studies, such as those conducted by Blatt, Kohlberg, Turiel and others, have indicated that classroom discussions of ethical dilemmas do stimulate moral growth. The dilemmas provide problem solving activities while the group discussion allows participants to share knowledge and views.

Group interaction may take the form of varying processes and have varying goals. Deutsch and Gerard (1955), Torrance (1957), and Festinger (1954), among others, have suggested that groups which seek consensus exert more
pressure and raise more inner conflict than do groups which remain open-ended. A direct link thus has been established between conflict and the desire for consensus.

Problem solving and group interaction are inherent in the dilemma discussion, hence inner conflict becomes the remaining element which is critical to the developmental process. Since both intrapersonal and interpersonal conflict have been linked to consensus seeking but not to open-ended discussion, it has been hypothesized that the consensus seeking group process is more effective in raising the level of moral judgment than open-ended discussions.

The moral judgment of health professionals has always been critical. Today, as the role of dental hygienists is expanding and as these health professionals are acquiring broadened responsibility for patient welfare, it is becoming increasingly vital for this group of health providers to be ready and able to use sound moral judgment in making timely and ethical decisions.

The education of dental hygienists is standardized through accreditation of educational programs and validated through licensure. Moral and ethical learning is mandated as part of the overall dental hygiene education, yet few guidelines and no teaching strategies have been established as part of the curriculum. Now is the time to develop and validate methods which will stimulate the moral maturity of these students. The purpose of this dissertation was to determine if the level of moral reasoning of dental hygiene
students could be improved through discussion of professionally oriented moral dilemmas, as well as the type of group interaction, in this case - open-ended or consensus seeking discussions, that is more effective in stimulating moral development.

This study employed two treatment groups, randomly assigned from the same population, and a nonequivalent control group. The dilemma discussion technique lasted over six weeks, during which the treatment groups met for two hours each week. A posttest and follow-up test were conducted to assess differences between the treatment groups and the control group and the treatment groups with each other.

While the tests of the hypotheses indicated that there were no statistically significant differences among groups, it was observed that the treatment groups produced higher P scores on the posttest and the follow-up administration of the Defining Issues Test as well as a greater change in score, post- to follow-up test than did the control group. In addition to the objective measure of the P scores, the subjective impressions of the students enrolled in the experimental class, collected as part of the course evaluation, indicated that the dilemma discussion method was more appealing and interesting than would have been a series of lectures.

It was noted also that the consensus seeking group displayed higher scores on the posttest and follow-up and greater change in scores than did the open-ended group.
These observations suggest that the dilemma discussion method may have had a positive effect on the treatment groups' moral judgment and that consensus seeking discussions may have stimulated the moral development of the subjects more effectively than open-ended group discussions.

Restrictions on Interpretations

In testing the hypotheses, no statistically significant results were obtained. There may have been some reasons, however, why this investigation, which replicated the studies of Maitland and Goldman (1974) and Geis (1977), did not produce the same level of statistical results. The sample size was small. Originally there were 40 subjects in the experimental group, divided equally between the two treatment groups. However, only 36 students completed the protocol, 18 in each treatment group. The control group also was reduced to 18 because of incomplete protocols. Larger samples, such as those employed in Maitland and Goldman's and Geis's studies, might have produced different results.

The number in the sample was small at the outset and further reduced by subject mortality. In addition, only one-half of each group was pretested; therefore, only a very small number (N = 9) in each group was compared for changes from pretest to posttest and pretest to follow-up. While statistical differences were found in the change in scores from pretest to follow-up between the pretested subgroups,
similar results were not obtained when the total groups were compared. The control group was similar, but nonequivalent. This reduced the researcher's ability to control for maturation and to generalize the results to populations other than the sample under study.

Time was another delimiting factor. While one hour per dilemma may have seemed adequate, the pressure of time may have had an adverse influence on the consensus seeking group. As noted in Chapter III, the fact that the open-ended discussion group usually took more time than the consensus seeking group surprised the researcher. Indeed, the pressure of time may have forced the consensus seeking group to come to a preconsensus decision rather than complete the consensual process. Another time factor may have been the hour the class met, which was Friday afternoons. This was the last class of the week which may have affected the seriousness of the students. The fact that the subjects completed the DIT's on their own time may also have influenced results. Some subjects may not have been as thoughtful in answering the DIT as home as they would have if it had been administered in class. The length of the treatment and of the follow-up period were short. Different data might have resulted if the treatment had lasted for a full semester. Also, a follow-up period of six months or one year would have given a better index of lasting results than was possible with a one month follow-up period.

Another restricting factor was with the relevant
dilemmas designed and used for this study. Some of the cases did not stimulate as much controversy as others. A case in point is Dilemma #8 (See Appendix A) which presented the case study of a dental hygienist who was asked to relinquish a much sought-after position in favor of a colleague who was restricted to this specific type of position because of a medical disability. The students did not recognize the ethical questions raised by this story, and therefore, the expected controversy did not develop and conflicting views were not shared.

There were 11 dilemmas used in the entire study; therefore, the fact that almost one-tenth of the treatment was not effective in stimulating conflict reduced the potency of the dilemma discussion method.

Conclusions

The statistical results of testing the hypotheses indicated that there was no difference between the experimental group and the control group. On this basis, therefore, the dilemma discussion treatment had no significant effect on the moral reasoning of the subjects. In addition, it was statistically demonstrated that there was no difference between the two treatment groups. Hence, neither consensus seeking nor open-ended group discussions had a significantly greater effect on moral judgment as measured by the DIT.

Since the statistical results indicated no difference between total treatment and nontreatment groups, as well as
no difference between the two treatment groups, the intervention studies of Blatt (1976), Turiel (1969), Maitland and Goldman (1974), and Geis (1977), which did find statistical differences, were not corroborated by this study. Blatt and Turiel found that the dilemma discussion method was effective in raising the level of moral reasoning of individuals and the studies of Maitland and Goldman and Geis showed that consensus seeking is more effective than open-ended discussions in stimulating moral development.

While these statistical findings do not validate previous research, the observations do support the results of prior investigations. The mean posttest score of the experimental group was 45.57 while that of the control group was 40.55. On the follow-up measure, the experimental group's score was 46.99 while the control group's was 41.18. It may be noted, therefore, that the experimental group scored 5.02 points higher on the posttest than the control group; and the difference in the follow-up scores was even greater at 5.81. Thus, while the difference was statistically nonsignificant, the treatment groups tested over 5 points higher than the control group on each test. These analyses might suggest that the dilemma discussion method was effective in raising the moral judgment of dental hygiene students just as it had been with high school students in Blatt's study.

The second theory which was tested by this research stated that consensus seeking discussions would be more
effective than open-ended group discussions in stimulating moral development. Again, the findings were not significant. In looking at the scores, however, it is clear that the consensus seeking group scored consistently higher than the open-ended group on the posttest (47.40 vs 43.74) as well as on the follow-up test (49.82 vs 44.17). The upward trend of the consensus seeking group on the follow-up test was particularly impressive, again over 5 points higher than the open-ended discussion group.

In reviewing trends, changes in scores were noted. The positive change in scores from posttest to follow-up test for the open-ended group and the control group were less than 1 point each while the positive change in scores for the consensus seeking group was 2.41 points. These observations agree with the empirical findings of Maitland and Goldman and Geis and may indicate that the moral development of dental hygiene students is more effectively stimulated by consensus seeking discussions than by open-ended group discussions.

Implications for Dental Hygiene Education

The Accreditation Standards for Dental Hygiene Education Programs (1979) require ethical aspects of dental hygiene practice to be included in the curriculum, yet the Curriculum Guidelines for Dental Hygiene Education (1979) do not outline content or strategies which fulfill this mandate. These guidelines do, however, propose content and
method in specific detail for all the other major requirements of the curriculum. Technically and theoretically capable hygienists are being graduated from the approximately 200 dental hygiene programs, but these graduates may be lacking in the knowledge and skills needed to make ethical decisions. Educational programs must address this area of preparation, thereby equipping future hygienists with the technical skills as well as cognitive and moral judgment needed to meet the challenges of the future.

If dental hygiene educators are to take on and succeed at this task and satisfy the mandate, they will need both content and methods for meeting this requirement. While the combined strategies of consensus seeking and dilemma discussion which were tested by this research statistically were not shown to be effective in achieving the objective of raising the level of moral judgment of dental hygiene students, observation of the results does indicate that this teaching method may have promise toward realizing this goal. Even though the results of this research were statistically nonsignificant, it may be suggested that the dental hygiene curriculum incorporate ethical aspects of dental hygiene practice by adopting the consensus seeking/dilemma discussion method as outlined in this paper.

Questions for Further Research

In addition to correcting the delimitations noted earlier in this chapter, there are several questions which
the author would recommend for further research. These center on four areas around which new research could take place. First, in order to assist in the successful replication of this research, several critical suggestions are presented. Second, a comparison of the DIT with the DHAT to identify the cognitive areas which are common to both tests. Third, the development of an instrument similar to the DIT but more applicable to today's students in the health professions. Fourth, a comparison of leaderless group discussions such as those conducted in this research study with leader-led discussions.

Given the opportunity to repeat this study, several modifications would be adopted. The entire population of each group would be pretested. This would eliminate the problem of subgroups of small numbers and would allow pre-to posttest and pretest to follow-up comparisons to be made for the total treatment and control groups. More time would be allowed for the treatment phase; a semester would be a more appropriate length of time than six weeks. A longer period would be allowed between the posttest and the follow-up test; six months is recommended in order to better assess the lasting effects of the treatments. More than one hour's time would be allowed for resolution of each dilemma. This might provide a better opportunity for the consensus seeking group to complete the consensus seeking process. An in-class time would be scheduled for the subjects to complete the DIT's, therefore, increasing the
likelihood of proper compliance with the protocol.

Since the size of the population was small and became a problem especially when several subjects were lost due to incomplete protocols, if repeating this study, the size of the population would be increased by involving several classes of students. This might allow for the control group to be randomly assigned from the same population as the treatment groups. This would increase the likelihood of similar groups at the outset of the study and, if randomly selected, would increase the generalizability of the results.

The unevenness of the dilemma stories may have reduced the potency of the dilemma story method; therefore, it is recommended that all of the case studies used to stimulate group discussion should be pilot tested prior to classroom use. Before repeating this strategy with a new class of students, the dilemma stories will be shared with colleagues and students to assure their relevance to the subjects.

In addition to the above modifications, a final change may be suggested. Since portions of the DIT seemed irrelevant to dental hygiene students, a new instrument may be designed and employed with this type of student.

A second promising area for further research might be a correlation between scores achieved on the DHAT, DIT and perhaps the SAT or ACT. This investigation might yield some relationships among these cognitive tests and thus give weight to the relationship between moral judgment as
measured and cognitive skill.

In using the DIT, it was found that some of the dilemmas were so remote from the experiences of dental hygiene students that they were unable to identify with them. Also, one of the stories in particular is out of date for use with today's students. The story regarding the student take-over does not have any relevance for students in the 1980's (See Appendix D). A new and specifically designed instrument should be used with dental hygiene students and students from the other health professions. The stories incorporated could be taken from the real life experiences of health professionals, just as were the dilemmas used for class discussions which appear in Appendix A.

Blatt (1976) conducted his second study using several high school classes with little teacher interaction. Other investigations, such as those conducted by Galbraith and Jones (1976) and Turiel (1969), had a high level of teacher/leader participation in the group discussions. In further research, the effect of an active group leader's influence might be identified as positive, negative or neutral in contributing to the moral development of the students.

Since the moral judgment of practicing dental hygienists is of importance to the welfare of the public, it is critical that educational programs preparing future dental hygienists identify and incorporate experiences for these students which stimulate moral sensitivity and judgment. Further research should be implemented which addresses this
goal and attempts to validate learning strategies which will enhance the moral judgment of students in the health professions.
APPENDIX A

Dilemma #1

Sue Webster has been a hygienist for three years. She has been working with several general practitioners, but has recently started to work full time in a periodontal office. Dr. Smith has a good reputation and seems to get good results; however, he always performs extensive periodontal surgery on his patients and never seems to recommend more conservative therapies.

Today, Ms. Downs has an appointment for consultation and treatment planning. As usual, Dr. Smith has recommended the most extensive treatment possible and has not provided Ms. Downs with a number of less invasive treatments. After her consultation, she has an appointment with the hygienist, Ms. Webster, to initiate pre-operative scaling. Ms. Downs has talked to a number of friends and read about periodontal therapy in a lay journal; she thinks there might be alternative, less radical treatments but was afraid to ask Dr. Smith about her options. During the course of her scaling appointment, she asks Ms. Webster about the effectiveness of several other treatments, at least one of which would be an acceptable, less radical treatment for Ms. Downs' type of periodontal problem. Should Sue explain these other treatments?
Dilemma #2

One day in late October, Mrs. Rogers came to the dental clinic because she heard dental care could be provided to the elderly at low cost. Even though she is over sixty, she has most of her teeth and little periodontal involvement. She wants to have good care but is on a fixed pension which allows her no luxuries.

The young dentist who sees Mrs. Rogers and plans her treatment wants the best for his new patient and recommends that she have her missing upper right first molar replaced with a fixed bridge.

He tells her about the alternative of having a removable single unit partial, at a much lower cost, but highly recommends the fixed bridge.

After listening to the diagnosis and recommended treatment plan, Mrs. Rogers has to choose the treatment she will have. She tells the dentist and the hygienist that she can afford the fixed bridge only if she goes to a senior citizens nutrition site for all her meals because they only charge 25¢ per meal and she cannot buy and cook food that inexpensively. She figures that she will have to do this for six months while she pays for the fixed bridge. This means a walk of four blocks each way, traveling through a part of town which is not too safe these days.

She asks both the dentist and the hygienist for advice. The dentist says that he feels the fixed bridge
is preferred, and she should have the treatment if possible.

Should the hygienist agree with the dentist and encourage Mrs. Rogers to have the best treatment or should the hygienist disagree with the dentist and advocate for the less expensive but adequate treatment?

Dilemma #3

Ever since Eric's mother realized the importance of fluoride a year and a half ago, she has been very conscientious about bringing her family to the dental office for prophylaxis and fluoride treatments. Although the city water is fluoridated, Eric's family lives on the outskirts of town and they drink well water. For this reason, Eric's mother was advised to have the children use a fluoride toothpaste and keep regular recall visits with the dental hygienist every six months.

Eric is ten years old and was a cooperative patient at his first and second dental visits; today, however, as he entered the operatory, he announced that he would not have a fluoride treatment.

The dental hygienist updated the medical history with Eric's mother and knows that the appointment was made specifically for the fluoride treatment; she also knows that in spite of her careful procedure in administering the fluoride treatment to Eric on the last two occasions, he became ill both times and vomited in the car on his way home.

Eric does not want to feel sick or vomit again and
he is convinced that the fluoride treatments made him sick. Upon completion of the prophylaxis, he refuses the fluoride treatment. In speaking about the situation with Eric's mother, she becomes anxious about his dental health and suggests that they restrain Eric and apply the fluoride treatment.

Should the dental hygienist comply with the mother's wishes and force the fluoride treatment on Eric, or should the dental hygienist tell the mother that she will not administer the fluoride treatment against Eric's will.

Dilemma #4

Mrs. Smith and her teenage daughter, Jane, have been dental clients for five years. Today, they both have recall appointments with the hygienist. Jane's appointment is first, and while treating her, the hygienist realizes that Jane is "high." The hygienist has the opportunity to talk with Jane; and since she has trusted her hygienist for many years, Jane confides in the dental hygienist and tells her that she regularly is using a dangerous substance. Although Jane does not seem sincerely interested in following through with seeking help at the local drug rehabilitation center, she begs the hygienist not to tell her mother about her drug problem.

During the course of Mrs. Smith's appointment, she inquires about Jane's health.

Should the dental hygienist tell Mrs. Smith about
Jane's problem?

Dilemma #5

When Mary Smith graduated from Dental Hygiene School two years ago, she was immediately employed in the office of Dr. Jones. It soon became apparent that the office was poorly equipped, sterilization procedures were inadequate and some of the personnel were not taking the proper precautions when taking radiographs. Dr. Jones' treatment, however, did not seem to be below the standard Ms. Smith had been taught in school. She asked Dr. Jones if he would correct the deficiencies but when he said he did not feel the need to re-equip his office, Ms. Smith gave him two weeks notice and left his employ.

Fortunately, he gave her a nice reference and she has been working for the past two years for Dr. Green who is a fine periodontist. Dr. Green, however, is a personal friend of Dr. Jones and has on occasion referred patients who needed a general practitioner to him. Recently, one of Dr. Jones' patients started periodontal therapy with Dr. Green. Recognizing Ms. Smith as Dr. Jones' former dental hygienist, he specifically asks her if he should return to Dr. Jones or seek a new general dentist for his family.

Should Mary Smith encourage the patient to seek a new dentist?
Dilemma #6

Mrs. Springfield, a divorced middle-aged woman with a ten year old son, became a regular dental patient about six months ago. She and her son received preventive services from the dental hygienist at which time it was noticed that Ms. Springfield was a highly nervous person, and her son, Billy, was an overweight pre-adolescent who displayed immature behavior. Ms. Springfield smokes a pack or more of cigarettes each day, and when she had her first oral examination six months ago, the hygienist discussed the possible formation of pre-cancerous lesions on her buccal mucosa. Although she was warned to stop smoking at that time, she has not stopped or even cut back on her smoking since the last visit.

When Mrs. Springfield came in for her recall visit on Tuesday of this week, the condition of her buccal mucosa had worsened and the dentist, Dr. Budge, immediately performed a biopsy on her.

Because Dr. Budge had to attend a professional meeting on Thursday and Friday of this week, the receptionist reappointed Ms. Springfield for Monday morning to receive the results of the biopsy; however, she inadvertently told Ms. Springfield that pathology reports usually return from the laboratory in two days.

Late Thursday afternoon, Ms. Springfield called the office to see if the pathology report had been returned.
Laboratory reports are routinely entered into the patient's record and since the hygienist had been updating Ms. Springfeld's file on that day, she knew the results were negative. Ms. Springfeld was told that Dr. Budge was at a convention but the office would try to contact him and ask him to return her call.

On Friday, Ms. Springfeld called the office several times to ask if the doctor got her message. Finally at the end of the day, when it is clear that the office is unable to contact the doctor, she asks to speak to the hygienist since she was the one who first noticed her condition. In speaking with her, the hygienist can tell how very upset and agitated she is. She is almost beside herself when it is suggested that she wait until Monday morning when she has her appointment with Dr. Budge to get the news of the results of the biopsy.

Should the hygienist tell the patient that the results were negative?

Dilemma #7

Two oral surgeons at the medical center have perfected a new surgical technique which will correct the severe facial deformity of ankylosis of the TMJ which limits the opening of the afflicted person's mouth to a millimeter or two and which may occur as the result of an infection, injury or surgery. While this treatment is successful and has few risks, it can only be performed on a few patients
each year. Since there are many afflicted persons seeking treatment, a panel has been appointed to choose those who will receive the treatment.

In choosing the next client for treatment, three candidates have been proposed; only one will receive treatment.

Should the committee choose the one who will receive treatment by random selection or based upon individual circumstances and personal characteristics?

Dilemma #8

Jean Fitz, RDH, has been working in a busy dental office for a number of years and performs routine dental hygiene services including initial patient exams and radiographs. However, she has been very interested in being able to perform the expanded functions she learned in dental hygiene school. The office has one EDDA (expanded duty dental auxiliary) and does not need two persons performing in this role. The EDDA, however, is planning to leave at the end of this month to marry and move to another state.

In order to prepare for the transition, a new RDH has been hired and is beginning to take on Jean's responsibilities while Jean learns how the EDDA functions.

The new RDH has been with the office for three weeks and everyone likes her and her work; however, just as Jean is about to take over the EDDA's job, the new RDH asks the
staff if she can become the EDDA rather than Jean, because she (the new RDH) has a rare skin disorder which is aggravated by handling and exposing X-rays. She has known about her condition for some time and has been looking for an office which uses an EDDA, but has not been able to find such a position. She declined to tell the staff about her problem when she was hired because she was afraid she would not get the job.

Should Ms. Fitz allow the new RDH to have the EDDA position?

Dilemma #9

For the past three years, D. Drake has been a practicing dental hygienist in a town which has a dental school with a dental hygiene program. She has been asked by the local Dental Hygiene Association to sit on the admissions committee of the dental school. This committee decides which prospective students will be admitted to both the dental school and the dental hygiene program.

In reviewing folders of aspiring dental students, Ms. Drake realized that one of these candidates was a neighbor who has undergone several years of psychotherapy. While the application and student's health history do not indicate any therapy, the academic record shows several instances where the student withdrew from all classes one semester, successfully returning the following semester.

As is usually the case, there are more qualified
applicants for student spaces than can be admitted. This student, however, has one of the highest QPA's, and will most likely receive a positive vote from other members on the committee.

Should Ms. Drake tell the committee what she knows about the candidate's mental health?

Dilemma #10

Dr. Williams has the only dental practice in Whoville. His practice has grown and his office is open six days a week. In spite of his efforts to recruit a partner, there does not seem to be another dentist willing to settle in Whoville.

Now Dr. Williams has decided that six days a week is too much for him, and he is going to cut down to five days. This means the hygienist will also have to cut back to five days.

The staff talks it over and realizes that by cutting back, some patients will have to delay treatment and no new patients can be accommodated.

The staff does not want to deny service to those who need it, but just cannot continue to work so hard. Unless the office remains open at least 5 1/2 days per week, the office policy will have to be not to accept any new clients.

Should Dr. Williams and the staff continue to work at least 5 1/2 days?
Dilemma #11

Mary Jones is a practicing dental hygienist who devotes one day a week to the public schools in her county. In her capacity as a volunteer school hygienist, she plans and presents educational programs to all first, third and sixth graders in the community; assists the public school nurse with the physical screening process each fall and serves as a resource person to the teachers. On occasion Mary has assisted parents to find dental treatment for their children.

This week Ms. Brown, one of the fifth grade teachers, has approached Mary with a problem concerning one of her new students. Johnny is an active, eleven year old boy who does not do well in his studies and who seems to be aggressive in most personal encounters. His family is not well-off financially, but they do not qualify for public assistance. Ms. Brown, the fifth grade teacher, has recently come to realize that Johnny is in constant pain that is caused by a number of badly decayed teeth. Ms. Brown has contacted Johnny's mother; but she has stated that while she worries about Johnny, there are six other children in the family and all of them need some care. She does not have the money for a visit to the dentist, and this family is not entitled to Medicaid.

Ms. Brown presents this problem to Mary. What can be done for Johnny and his brothers and sisters? With no
money to pay for dental treatment and no public health dental clinic in the county, how can services be provided to Johnny and others like him?

Of course, Mary knows the three dentists in town; but should she try to arrange charity dental work for these children? What about all the other children in need of dental care in this community?

Should Mary arrange charity dentistry for Johnny?
APPENDIX B
CONSENT FORM

PLEASE PRINT, one letter/number per box.

PARTICIPANT'S NAME:   / / / / / / / / / /   / / / / /
Last                      First
/ / / / / (Middle Initial)

SOCIAL SECURITY NUMBER (last four digits):   / / / / /

MAIDEN NAME:   / / / /  / / / / /

PROJECT TITLE: The Effect of Two Types of Peer Group
Interaction on the Moral Judgment of Dental Hygiene Students

This is to certify that I, _____________________________,
agree to participate in studies related to
evaluating the effect of two types of peer group
interaction on the moral judgment of Dental Hygiene
students. The program and its objectives have been
described to me. I understand that my participation
in the evaluation of this study is totally voluntary
and that I may withdraw my participation at any time,
without prejudice.

I agree to permit the investigator to utilize data
from the surveys and demographical information. I
understand that I will be asked to complete certain
surveys from time to time. I understand that all
information provided will be coded so that my
identity will not be known, and will be reported
only as group data. I understand also that none of
the information collected will be utilized for any
other purpose without my expressed permission, nor
will it be made a part of my school records.
Although I will be free to question the purpose of any aspect of the evaluation study at any time, I realize that information related to specific issues may not be disclosed to me before data are collected when my prior knowledge of such information is considered likely to alter my responses.

DATE PARTICIPANT'S SIGNATURE

DATE WITNESS'S SIGNATURE

If you have any questions, please contact your advisor.
APPENDIX C
DECISION BY CONSENSUS

INSTRUCTIONS: This is an exercise in group decision making. Your group is to employ the method of group consensus in reaching its decision. This means that the ranking for each action or resolution must be agreed upon by each group member before it becomes a part of the group decision. Consensus is difficult to reach. Therefore, not every ranking will meet with everyone's complete approval. Unanimity, however, is not a goal (although it may be achieved unintentionally), and it is not necessary that every person be as satisfied as he might be, for example, if he had complete control over what the group decides. What should be stressed is the individual's ability to accept a given ranking on the basis of logic - whatever his level of satisfaction - and his willingness to entertain such a judgment as feasible. When the point is reached at which all the group members feel this way as a minimal criterion, you may assume that you have reached a consensus as it is defined here and the judgment may be entered as a group decision. This means, in effect, that a single person can block the group if he thinks it necessary; at the same time, it is assumed that this option will be employed in the best sense of reciprocity. Here are some guidelines to use in achieving consensus:
1. Avoid *arguing* for your own rankings. Present your position as lucidly and logically as possible, but consider seriously the reactions of the group in any presentation of the same point.

2. Avoid "win-lose" stalemates in the discussion of rankings. Discard the notion that someone must win and someone must lose in the discussion; when impasses occur, look for the next most acceptable alternative for both parties.

3. Avoid changing your mind *only* in order to avoid conflict and to reach agreement and harmony. Withstand pressures to yield which have no objective or logically sound foundation. Strive for enlightened flexibility; avoid outright capitulation.

4. Avoid conflict-reducing techniques such as the majority vote, averaging, bargaining, coin flipping, and the like. Treat differences of opinion as indicative of an incomplete sharing of relevant information on someone's part and press for additional sharing, either about task or emotion data, where it seems in order.

5. View differences of opinion as both natural and helpful rather than as a hindrance in decision making. Generally, the more ideas expressed the greater the likelihood of conflict will be; but the richer the array of resources will be as well.

6. View initial agreement as suspect. Explore the reasons underlying apparent agreements; make sure that people
have arrived at similar solutions for either the same basic reasons or for complementary reasons before incorporating such solutions in the group decision.

This questionnaire is aimed at understanding how people think about social problems. Different people often have different opinions about questions of right and wrong. There are no "right" answers in the way that there are right answers to math problems. We would like you to tell us what you think about several problem stories. The papers will be fed to a computer to find the average for the whole group, and no one will see your individual answers.

Please give us the following information:

Name ___________________________________________  ___female
Age ___ Class and period _____________________________  ___male
School ____________________________________________

In this questionnaire you will be asked to give your opinions about several stories. Here is a story as an example.

Frank Jones has been thinking about buying a car. He is married, has two small children and earns an average income. The car he buys will be his family's only car. It will be used mostly to get to work and drive around town, but sometimes for vacation trips also. In trying to decide what car to buy, Frank Jones realized that there were a lot of questions to consider. Below there is a list of some of these questions.

If you were Frank Jones, how important would each of these questions be in deciding what car to buy?
Instructions for Part A: (Sample Question)

On the left hand side check one of the spaces by each statement of a consideration. (For instance, if you think that statement #1 is not important in making a decision about buying a car, check the space on the right.)

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<td>1. Whether the car dealer was in the same block as where Frank lives. (Note that in this sample, the person taking the questionnaire did not think this was important in making a decision.)</td>
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<td>2. Would a used car be more economical in the long run than a new car. (Note that a check was put in the far left space to indicate the opinion that this is an important issue in making a decision about buying a car.)</td>
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<td>3. Whether the color was green, Frank's favorite color.</td>
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<td>4. Whether the cubic inch displacement was at least 200. (Note that if you are unsure about what &quot;cubic inch displacement&quot; means, then mark it &quot;no importance.&quot; )</td>
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<td>5. Would a large, roomy car be better than a compact car.</td>
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<td>6. Whether the front connibilies were differential. (Note that if a statement sounds like gibberish or nonsense to you, mark it &quot;no importance.&quot; )</td>
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Instructions for Part B: (Sample Question)

From the list of questions above, select the most important one of the whole group. Put the number of the most important question on the top line below. Do likewise for your 2nd, 3rd and 4th most important choices. (Note that the top choices in this case will come from the statements that were checked on the far left-hand side--statements #2 and #5 were thought to be very important. In deciding what is the most important, a person would re-read #2 and #5, and then pick one of them as the most important, then put the other one as "second most important," and so on.)

Most Important  5
Second Most Important  2
Third Most Important  3
Fourth Most Important  1
In Europe a woman was near death from a special kind of cancer. There was one drug that the doctors thought might save her. It was a form of radium that a druggist in the same town had recently discovered. The drug was expensive to make, but the druggist was charging ten times what the drug cost to make. He paid $200 for the radium and charged $2,000 for a small dose of the drug. The sick woman's husband, Heinz, went to everyone he knew to borrow the money, but he could only get together about $1,000, which is half of what it cost. He told the druggist that his wife was dying, and asked him to sell it cheaper or let him pay later. But the druggist said, "No, I discovered the drug and I'm going to make money from it." So Heinz got desperate and began to think about breaking into the man's store to steal the drug for his wife.

Should Heinz steal the drug? (Check one)

Should steal it

Can't decide

Should not steal it

From the list of questions that follows, select the four most important:

Most Important
Second Most Important
Third Most Important
Fourth Most Important
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12. Would stealing in such a case bring about more total good for the whole society or not.

QUESTION 2

STUDENT TAKE-OVER

At Harvard University a group of students, called the Students for a Democratic Society (SDS), believe that the University should not have an army ROTC program. SDS students are against the war in Viet Nam, and the army training program helps send men to fight in Viet Nam. The SDS students demanded that Harvard end the army ROTC training program as a university course. This would mean that Harvard students could not get army training as part of their regular course work and not get credit for it towards their degrees.

Agreeing with the SDS students, the Harvard professors voted to end the ROTC program as a university course. But the President of the University stated that he wanted to keep the army program on campus as a course. The SDS students felt that the President was not going to pay attention to the faculty vote or to their demands.

So, one day last April, two hundred SDS students walked into the university's administration building, and told everyone else to get out. They said they were doing this to force Harvard to get rid of the army training program as a course.

Should the students have taken over the administration building? (Check one)

Yes, they should take it over

Can't decide

No, they shouldn't take it over

From the list of questions that follows, select the
four most important:

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1. Are the students doing this to really help other people or are they doing it just for kicks?

2. Do the students have any right to take over property that doesn't belong to them?

3. Do the students realize that they might be arrested and fined, and even expelled from school?

4. Would taking over the building in the long run benefit more people to a greater extent?

5. Whether the president stayed within the limits of his authority in ignoring the faculty vote.

6. Will the takeover anger the public and give all students a bad name?

7. Is taking over a building consistent with principles of justice?

8. Would allowing one student takeover encourage many other student takeovers?
9. Did the president bring this misunderstanding on himself by being so unreasonable and uncooperative?

10. Whether running the university ought to be in the hands of a few administrators or in the hands of all the people.

11. Are the students following principles which they believe are above the law?

12. Whether or not university decisions ought to be respected by students.

QUESTION 3

ESCAPED PRISONER

A man had been sentenced to prison for 10 years. After one year, however, he escaped from prison, moved to a new area of the country, and took on the name of Thompson. For 8 years he worked hard, and gradually he saved enough money to buy his own business. He was fair to his customers, gave his employees top wages, and gave most of his own profits to charity. Then one day, Mrs. Jones, an old neighbor, recognized him as the man who had escaped from prison 8 years before, and whom the police had been looking for.

Should Mrs. Jones report Mr. Thompson to the police and have him sent back to prison? (Check one)

Should report him

Can't decide

Should not report him

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**IMPORTANCE:**

1. Hasn't Mr. Thompson been good enough for such a long time to prove he isn't a bad person?

2. Everytime someone escapes punishment for a crime, doesn't that just encourage more crime?

3. Wouldn't we be better off without prisons and the oppression of our legal systems?

4. Has Mr. Thompson really paid his debt to society?

5. Would society be failing what Mr. Thompson should fairly expect?

6. What benefits would prisons be apart from society, especially for a charitable man?

7. How could anyone be so cruel and heartless as to send Mr. Thompson to prison?

8. Would it be fair to all the prisoners who had to serve out their full sentences if Mr. Thompson was let off?

9. Was Mrs. Jones a good friend of Mr. Thompson?
10. Wouldn't it be a citizen's duty to report an escaped criminal, regardless of the circumstances?

11. How would the will of the people and the public good best be served?

12. Would going to prison do any good for Mr. Thompson or protect anybody?

**QUESTION 4**

**WEBSTER**

Mr. Webster was the owner and manager of a gas station. He wanted to hire another mechanic to help him, but good mechanics were hard to find. The only person he found who seemed to be a good mechanic was Mr. Lee, but he was Chinese. While Mr. Webster himself didn't have anything against Orientals, he was afraid to hire Mr. Lee because many of his customers didn't like Orientals. His customers might take their business elsewhere if Mr. Lee was working in the gas station.

When Mr. Lee asked Mr. Webster if he could have the job, Mr. Webster said that he had already hired somebody else. But Mr. Webster really had not hired anybody, because he could not find anybody who was a good mechanic besides Mr. Lee.

What should Mr. Webster have done? (Check one)

- Should have hired Mr. Lee
- Can't decide
- Should not have hired him

From the list of questions that follows, select the four most important:
Most Important  
Second Most Important  
Third Most Important  
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1. Does the owner of a business have the right to make his own business decisions or not?

2. Whether there is a law that forbids racial discrimination in hiring for jobs.

3. Whether Mr. Webster is prejudiced against orientals himself or whether he means nothing personal in refusing the job.

4. Whether hiring a good mechanic or paying attention to his customers' wishes would be best for his business.

5. What individual differences ought to be relevant in deciding how society's roles are filled?

6. Whether the greedy and competitive capitalistic system ought to be completely abandoned.

7. Do a majority of people in Mr. Webster's society feel like his customers or a majority against prejudice?

8. Whether hiring capable men like Mr. Lee would use talents that would otherwise be lost to society.
9. Would refusing the job to Mr. Lee be consistent with Mr. Webster's own moral beliefs?

10. Could Mr. Webster be so hard-hearted as to refuse the job, knowing how much it means to Mr. Lee?

11. Whether the Christian commandment to love your fellow man applied in this case.

12. If someone's in need, shouldn't he be helped regardless of what you get back from him?

QUESTION 5
THE DOCTOR'S DILEMMA

A lady was dying of cancer which could not be cured and she had only six months to live. She was in terrible pain, but she was so weak that a good dose of painkiller like morphine would make her die sooner. She was delirious and almost crazy with pain, and in her calm periods, she would ask the doctor to give her enough morphine to kill her. She said she couldn't stand the pain and that she was going to die in a few months anyway.

What should the doctor do? (Check one)

He should give the lady an overdose that will make her die

Can't decide

Should not give the overdose

From the list of questions that follows, select the four most important:
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<td>1. Whether the woman's family is in favor of giving her the overdose or not.</td>
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<td>2. Is the doctor obligated by the same laws as everybody else if giving her an overdose would be the same as killing her.</td>
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<td>3. Whether people would be much better off without society regimenting their lives and even their deaths.</td>
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<td>4. Whether the doctor could make it appear like an accident.</td>
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<td>5. Does the state have the right to force continued existence on those who don't want to live.</td>
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<td>6. What is the value of death prior to society's perspective on personal values?</td>
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<td>7. Whether the doctor has sympathy for the woman's suffering or cares more about what society might think.</td>
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<td>8. Is helping to end another's life ever a responsible act of cooperation.</td>
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9. Whether only God should decide when a person's life should end.

10. What values the doctor has set for himself in his own personal code of behavior.

11. Can society afford to let everybody end their lives when they want to?

12. Can society allow suicides or mercy killing and still protect the lives of individuals who want to live?

QUESTION 6

NEWSPAPER

Fred, a senior in high school, wanted to publish a mimeographed newspaper for students so that he could express many of his opinions. He wanted to speak out against the war in Viet Nam and to speak out against some of the school's rules, like the rule forbidding boys to wear long hair.

When Fred started his newspaper, he asked his principal for permission. The principal said it would be all right if before every publication Fred would turn in all his articles for the principal's approval. Fred agreed and turned in several articles for approval. The principal approved all of them and Fred published two issues of the paper in the next two weeks.

But the principal had not expected that Fred's newspaper would receive so much attention. Students were so excited by the paper that they began to organize protests against the hair regulation and other school rules. Angry parents objected to Fred's opinions. They phoned the principal telling him that the newspaper was unpatriotic and should not be published. As a result of the rising excitement, the principal ordered Fred to stop publishing. He gave as a reason that Fred's activities were disruptive to the operation of the school.

Should the principal stop the newspaper? (Check one)
Should stop it  __________  
Can't decide  __________  
Should not stop it  __________  

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<td>1. Is the principal more responsible to students or to the parents?</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2. Did the principal give his word that the newspaper could be published for a long time, or did he just promise to approve the newspaper one issue at a time?</td>
<td></td>
<td></td>
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<tr>
<td>3. Would the students start protesting even more if the principal stopped the newspaper?</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4. When the welfare of the school is threatened, does the principal have the right to give orders to students?</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5. Does the principal have the freedom of speech to say &quot;no&quot; in this case?</td>
<td></td>
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</table>
6. If the principal stopped the newspaper, would he be preventing full discussion of important problems?

7. Whether the principal's order would make Fred lose faith in the principal.

8. Whether Fred was really loyal to his school and patriotic to his country.

9. What effect would stopping the paper have on the student's education in critical thinking and judgments?

10. Whether Fred was in any way violating the rights of others in publishing his own opinions.

11. Whether the principal should be influenced by some angry parents when it is the principal that knows best what is going on in the school.

12. Whether Fred was using the newspaper to stir up hatred and discontent.
APPENDIX E
Open-ended Discussion Group

<table>
<thead>
<tr>
<th>Subject Number</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Pre-to Posttest Change</th>
<th>Follow-up</th>
<th>Post-to Follow-up Change</th>
<th>Pretest to Follow-up Change</th>
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Consensus Seeking Discussion Group

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**PRETESTED N = 9**

| Mean S.D. | 48.15 14.00 | 47.22 10.30 | -0.93 | 50.19 11.94 | +2.97 | +2.04 |

<table>
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<th>Pretest</th>
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<th>Follow-up</th>
<th>Post-to Follow-up Change</th>
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<td>31.67</td>
<td>-8.33</td>
<td>-23.33</td>
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**NOT PRETESTED N = 9**

| Mean S.D. | 47.59 10.64 | 49.44 15.59 | +1.85 |

**TOTAL N = GROUP 18**

| Grand Mean S.D. | 47.40 10.16 | 49.82 13.48 | +2.41 |
Control Group

<table>
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<th>Subject Number</th>
<th>P Score Achieved</th>
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<th>Follow-up</th>
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REFERENCES


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Vita

Lindsay Lorimer Rettie

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Birthplace: New York City

Education:

- 1978 - 1981 The College of William and Mary in Virginia
  Williamsburg, Virginia
  Certificate of Advanced Graduate Study in Education
  Doctor of Education
- 1976 - 1978 Old Dominion University
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- 1974 - 1975 Columbia University
  New York City
  Master of Science in Dental Hygiene
- 1954 - 1956 Columbia University
  New York City
  Bachelor of Science in Dental Hygiene
- 1952 - 1954 Connecticut College
  New London, Connecticut
A COMPARISON OF THE EFFECTS OF OPEN-ENDED AND CONSENSUS SEEKING GROUP DISCUSSION PROCESSES ON THE MORAL JUDGMENT OF DENTAL HYGIENE STUDENTS

Lindsay L. Rettie, Ed.D.
The College of William and Mary in Virginia
Chairman: Professor Robert B. Bloom

The professional duties of dental hygienists are broadening and with this expansion comes new responsibilities for patient care. The future role of the dental hygienist will include new opportunities as well as new obligations which will require proficiency in dental hygiene skills and judgment. It is incumbent upon dental hygiene educators, therefore, to provide the educational experiences necessary to prepare the professionals of the future for clinical as well as moral decision making. The conceptual framework upon which this dissertation was based was the cognitive-developmental theory developed by John Dewey, Jean Piaget and Lawrence Kohlberg. This investigation combined the cognitive-developmental principle with the theories of group process to produce a teaching strategy designed to stimulate moral development.

The purpose of this study was to determine the relationship between in-class discussions of ethical dilemmas and the moral judgment of dental hygiene students. In addition, data were sought to determine which type of group interaction was more effective in stimulating moral development, open-ended or consensus seeking discussions.

In this investigation, the independent variable was moral judgment as measured by Rest's Defining Issues Test, an objective measure of moral judgment based upon Kohlberg's moral dilemmas. The dependent variables were (1) the dilemma discussion method and (2) the type of peer interaction or group discussion, open-ended or consensus seeking. The population studied consisted of two intact classes of first-year dental hygiene students. The experimental group was randomly assigned to the two treatments, open-ended or consensus seeking discussions. A nonequivalent control group was employed to control for the effects of history, maturation, testing and instrumentation. The experimental groups met for two hours a week during which they discussed ethical dilemmas which are relevant to dental hygiene practitioners. One of the treatment groups was required to seek consensus concerning the action to be taken in each dilemma while the other group's discussions remained open-ended. After six weeks of in-class discussions, the experimental and
control groups were posttested. One month after the completion of the treatment, a follow-up test was conducted to detect long-term and delayed action effects. Statistical procedures used were one-way analyses of variance with a priori orthogonal contrasts.

The statistical results did not support the hypotheses that stated that (1) the treatment groups would have a higher score on the DIT than the control group and (2) the consensus seeking group's DIT score would exceed that of the open-ended group. General observation of the data did indicate, however, that these predictions could be true if tested under different circumstances.

The major conclusions drawn by this study were that while there were no statistical differences between groups, nonempirical observations suggested that (1) the dilemma discussion method could have a positive effect on moral judgment and (2) consensus seeking discussion might be more effective than open-ended discussion in stimulating the moral development of dental hygiene students.